

Leeds closed shop deal falters

by David Jobbins

The leadership of the college lecturers' union is to bring the strongest possible pressure to bear to persuade its members at Leeds to tear up their post-entry closed shop agreements with the city council.

The executive of the National Association of Teachers in Further and Higher Education has authorized general secretary Mr Peter Dawson to write to the local liaison committee "strongly advising" them not to press on with the union membership agreement.

It has also accepted that it may be necessary to send a senior official and a member of the executive to Leeds for talks with the local officials.

Meanwhile, the main polytechnic site branch has voted for a postal ballot of Naffthe members to test the strength of support for the agreement, which requires all new



Peter Dawson: 'strong advice'

recruits who do not already belong to Naffthe to join.

The executive could constitutionally go no further than offer strong advice. But there is determination among leading members to crush what they regard as an unsatisfactory

agreement which has caused potentially serious damage to the union's standing.

Mr Dawson refused to discuss the terms of the threatened letter this week, but said that the union leadership would be delighted if the Leeds liaison committee rendered the move unnecessary by agreeing to surrender the agreement.

The moves at the polytechnic are directed towards forcing the liaison committee to give notice of termination of the agreement in January, so that it expires next summer.

But union leaders are unlikely to be satisfied by so slow a timetable, and would require speedier action.

The moment the liaison committee accepts that they should not pursue the agreement, they should get out of it the next day," one said.

A postal ballot at Hatfield Polytechnic has found that 82 per cent of lecturers who replied thought the Association of Polytechnic Teachers should be given local recognition.

Poly entrance on merit proposed

by John O'Leary

A new drive to encourage colleges and polytechnics to relax formal admission requirements and treat applications on their merits has been launched by the Council for National Academic Awards.

The Council has issued a circular, entitled *Extension of Access to Higher Education*, to make institutions more aware of the flexibility in its regulations and persuade them to take a wider range of students. They are reminded that the essential principle in offering places should be "a reasonable expectation that the student will be able to follow the course successfully."

Mr Graham Middleton, a CNAA Registrar, said this week that the timing of the initiative was not significant since it was an extension of discussions within the Council over the past two years. While some of the larger institutions were already aware of the possibility of admitting formally unqualified students, some of the newer members might not have what discretion they had, he said.

"The proportion of students admitted to degree courses without any formal qualifications is fairly small and they are nearly all mature students," he said. "But there are a range of qualifications which can be considered, not all of which are strictly equivalent to 'A' levels."

In the past three years, the proportion of students joining CNAA degree courses without the traditional entry requirements has risen from 15 to 21 per cent. In 1979, more than 1,900 of the 42,000 joining degree or diploma courses were mature, unqualified applicants.

The circular, which is expected to boost this total still further, emanates from the Council's committee on entry qualifications, which is chaired by Dr Ray Ricketts, director of Middlesex Polytechnic and chairman of the Committee of Directors of Polytechnics.

It tells institutions that 'A' levels, while still the normal yardstick, are by no means the only way in which students can show evidence of suitability for admission. All applicants should be judged on their total educational background and experience.

However, the circular stresses that the CNAA is not willing to lower entry standards, particularly in the case of recent school leavers who have failed 'A' levels. It urges institutions to distinguish between such students and those who have not had the opportunity to secure the normal qualifications or have followed different educational routes.

Bow Group paper urges creation of 'Open Tech'

by Charlotte Barry

The Government should set up an Open Tech on the lines of the Open University, a Conservative Bow Paper urged this week.

The Open Tech would provide adult training and retraining in technical skills using "distance teaching" methods pioneered by the Open Universities.

The scheme is being given serious consideration by the Government.

The Bow Paper, by Mr Michael Colvin, the Conservative MP for Bristol North West, develops the long-held belief by Employment Secretary Mr Jim Prior that an Open Tech would make better use of existing training resources, widen job opportunities and reduce unemployment.

Its most radical proposal is for all training to be concentrated under a Minister of Training within a new Department of Education and Training. This would take over responsibility from the Department of Employment, the Manpower Services Commission and local authorities.

Mr Colvin sees the Open Tech as being self-financing with courses

funded mainly by industry. Training allowances and tax incentives for individual trainees could be considered.

"Any shortfall should be covered either by fees or commercial sponsorship. A Government-backed loan scheme might overcome resistance by smaller firms and the BEC social fund should assist," the paper says.

Unlike the Open University, the Open Tech would not rely on a vast centralized machinery for providing a simple framework for co-ordinating and improving access to existing training facilities provided by universities, polytechnics, colleges, government bodies, industry and commerce.

Detail of these courses, practical work and additional printed material for study at home could be stored in a computer at the Open University, Mr Colvin suggests. Regional Open Tech offices, based on the Open Universities structure, would administer the scheme simply with the help of nearby Job Centres.

An Open Tech—a proposal for tackling Britain's skill shortages—by Michael Colvin, page 22.50 from Bow Publications Ltd, 240 High Holborn, London WC1.

Move to quell diploma fears

New moves may be made to recognize a transitory working party which last met seven years ago to quell growing dissatisfaction over the universities' attitude towards the Diploma in Higher Education.

The group, composed of representatives of the University Grants Committee and the Council for National Academic Awards, laid down the original guidelines for the DipHE in its recommendations in 1972.

The group should constitute two years' credit for those wishing to transfer on to degree courses.

However, few universities have taken holders of the DipHE on to the final year of degree courses even where they validate the award themselves. New figures produced by the CNAA show that only one diploma made such a transfer from one of the council's courses

last year, whereas 11 students were given places on the second year of university courses.

Since 1977, only Hull, Lancaster, Loughborough and Reading universities have given two years credit to full-time students joining degree courses with a CNAA diploma. An agreed system of credit transfer operates with the Open University for part-time study.

Officials of the CNAA approached the UGC earlier in the year with a proposal to reconvene the original working group on the DipHE but were rebuffed because of the imminent publication of the *Boyson* report on credit transfers.

A subsequent meeting of diploma course leaders viewed the question of university cooperation as a major objective of the development of the DipHE. The group is now approaching the UGC.

OU angry at Government's fees imposition

The Open University has reacted angrily to a Government letter telling them to impose student fee increases of 40 per cent.

The university fears the massive rise in fees will cause widespread student protests, leading to a loss of 20,000 students and the 21,000 due to enrol with the OU next February.

to confront the Department of Education and Science over the proposed tuition fee level, which is likely to rise from £67 to £98 a year.

Summer school fees are expected to rise significantly from their present level of £62.

The DES has told the university that its financial grant for 1982 will be made on the assumption that students will be charged these

Finance rules 'wrong for smaller colleges'

by Paul Flather

Local authority officers were expected to tell the Government this week that new rules for financing student unions were unworkable in smaller colleges with high levels of non-advanced work.

This will come as a major setback to Ministers and Department of Education and Science officials, who have been resisting strong pressure from local authorities and from students to modify or postpone implementation of the new rules.

Both the Council of Local Education Authorities (CLEA) and the National Union of Students (NUS) support the principles behind the new rules, which will bring student union funding under the scope of the college or university recurrent grant.

The new system would meet criticisms of the old system, based on automatic funding of an agreed capitation fee, by the Public Accounts Committee on grounds of lack of accountability.

But CLEA officers have pressed the DES for guidance on applying the new rules to students on non-advanced further education (NAFE) courses; how to ensure student unions will retain freedom to manage their own affairs; and how to find money for unions who spend more than the average £32 grant

for each student fixed by the Government.

CLEA officers have at times been surprised by the apparent lack of concern among DES officers to deal with these problems. The week they will tell Dr Rhodes Boyson, under-secretary of state for higher education, that some of the problems cannot be solved.

CLEA now want to continue with existing rules at colleges with high levels of NAFE work, where students have widely differing modes of attendance and pay rates varying from £25 to £50. These student unions already have a high degree of local accountability, they say.

The University Grants Committee however has said it will indicate how much money has been included for student unions in its grant allocations. But this still falls far short of NUS demands for clear "university" funds.

Meanwhile the NUS, which has launched a national campaign to oppose immediate implementation of the new rules, has not DES statisticians to contest the £2 average per student to be added to recurrent grants from next year. The NUS, which claims to be the only complete and most recent set of figures, say for 1979 the average figure was £38 and adjusted for inflation the figure for the current year should be £44.

NELP may face strike call

Lecturers at North East London Polytechnic will be asked to strike if a rapid timetable for compulsory redundancies is not withdrawn.

The decision to go for strike action was taken by the national executive of the National Association of Teachers in Further and Higher Education in the face of the likely failure of a search for volunteers for a premature retirement compensation scheme to produce more than 50 names.

The polytechnic told the Department of Employment that it wants to make up to 62 staff redundant, but has agreed to put off issuing notices until the end of December pending the response to the PRC scheme.

The polytechnic's staff union are planned to meet during the week to vote on the extension of a strike call, which must receive a majority backing by the members.

the first redundancies of polytechnic lecturers.

Hope centred on persuading the DES to continue with voluntary means, and to explore fully the possibilities of training and redeployment. A training and redeployment scheme is in early stages of discussion but cannot be completed for two to three weeks.

The results of the search for PRC volunteers were to be discussed by union representatives and the polytechnic management yesterday.

As seems certain, not enough have come forward and the management cannot be swayed from its planned timetable, individuals facing redundancy will be told early next week.

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FE colleges lose recognition

Private further education colleges are to lose recognition by the Department of Education and Science after April 1982, Dr Rhodes Boyson, under-secretary for higher education, told the House of Commons this week.

The announcement aroused fears among the 150 institutions currently "recognised as efficient" that they will become indistinguishable to prospective students from the less reputable colleges which have sprung up in recent years.

Dr Boyson said the decision had been taken against the background of Government plans for reducing public service manpower. He added that the DES would be willing to advise and assist any representative organization in setting up a self-regulatory system of recognition or accreditation.

Although there is no obligation for a college to apply for recog-

nition, the system has been regarded as some indication of standards. There have been persistent complaints from some foreign universities and students' organizations that the number of colleges outside the system have overcrowded the mainly foreign recruits and caused an inadequate service.

No new applications for recognition are to be considered by the DES from now on. The only remaining inspection procedure is relating to the membership of the Association of Recognized English Language Schools, which number 50 of the 150 previously listed by the DES.

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Colleges hit worst by fees rise

by John O'Leary and Ngalo Crequer

Public sector institutions are bearing the brunt of a much more serious decline in overseas student numbers than the Government expects, a new survey suggests.

Early replies to a questionnaire circulated to 200 universities, colleges and polytechnics by the United Kingdom Council for Overseas Student Affairs reveal a drop of more than 40 per cent in colleges of further and higher education.

Returns from nine universities tally with findings expected to be contained in a comprehensive examination by the Committee of Vice-Chancellors and Principals, showing undergraduate numbers down by 11.5 per cent. The UKOSA study predicts a more dramatic decline, of almost 18 per cent, among postgraduate recruits.

With polytechnic results still to be completed, it is clear that the public sector has suffered most. A separate survey by the Committee of Directors of Polytechnics has found some institutions facing reductions of more than 20 per cent in their foreign intake, although the average is likely to be closer to the universities' figure.

The first 21 colleges replying to UKOSA showed that only 1,023 overseas students had registered on courses this year, compared with 1,519 in 1979. The decline was almost equally

felt in further and higher education.

Although UKOSA stresses that the results come from a small sample of institutions, it believes that the figures for the colleges provide a pointer to the long-term effects of the increase in overseas students' fees. The drop in further education numbers will mean that fewer students are already in the country with the intention of going on to university, while the colleges' later recruitment will reflect the impact of fee levels more accurately than university numbers.

The survey also confirms fears expressed by two Select Committees that the new fees would hit students from poor countries hardest. An analysis of countries of origin shows that only the United States has sent more students to Britain this year. While its numbers are up by 29 per cent, others are down by large amounts.

UKOSA's study predicts a more dramatic decline, of almost 18 per cent, among postgraduate recruits.

The monitoring exercise being carried out by the Department of Education and Science is not yet complete but is expected to provide more evidence of declining overseas recruitment in the colleges. The Association of Principals of Colleges is examining numbers locally and has found wide variation in the rate of decline.

Mr Neil Merritt, chairman of the Standing Conference of Principals and Directors of Colleges and Institutes in Higher Education, blamed the colleges' position on the requirement for higher fees in the public sector than in the universities.

Dr Rhodes Boyson has asked the Universities Central Council on Admission for a detailed breakdown by subject of undergraduate overseas applications for 1981 entry, so far as they have been received. Although only a seventh of the eventual number of overseas candidates have yet applied, UCCA already reports a fall of 43 per cent and expects a substantially greater reduction eventually.

The subject breakdown shows that by November 1,780 overseas students had applied for engineering and technology courses, compared with 1,559 the same time last year. Last year engineering/technology students formed 35 per cent of the total of overseas students and this year the percentage is 31 per cent.

The respective figures for pure science show a drop in applications from 587 last year to 327 this year. In the social sciences, where the courses tend to be cheaper, the figures show 1,041 applications last year, 671 this year.

In medicine and dentistry last year there were 833 applications and this year the number is 449, in languages 136 last year and 108 this year and there has been a small numerical increase in arts subjects, from 63 to 66.

Boyson in clash over student finance

Plans for a new system of funding student unions were thrown into turmoil this week as Dr Rhodes Boyson, under-secretary for higher education, had last-minute doubts about the method and size of next year's allocation.

Dr Boyson clashed with civil servants over their proposals for funding unions through an additional £10 million to be added to the amount of money set aside for them next year should be increased.

He agreed to allocate another £10 million to student unions for 1981-82 in order to fulfil his pledge that the same as for this year. The average contribution per student will rise from £32 to £44, making the total more than £22m.

The change of heart represented a reversal of calculations by the Department of Education and Science at the amount to be allocated this year were incorrect.

Dr Boyson, at a meeting on Tuesday with NUS officials, refused to order a delay in implementing a new system, announced his intention of going ahead with revised proposals, supported by the DES officials, that it was too late to introduce any other system.

Representatives of the Council of Local Education Authorities met Dr Boyson yesterday to discuss their arguments for unions to be funded directly through college budgets.

It is understood to be sympathetic to their contention that funding via tuition fees would be too complicated and does not comply with the principles for a new system, announced by Mr Mark Carlisle, Secretary of State for Education, last February. The revised plan that figures for the Rate Support Grant had been applied to the Department of the Environment on the basis of the tuition fee system, provoked a sharp exchange between Dr Boyson and officials.

A decision was expected today on which method of allocation would be employed next year. Dr Boyson is insistent that there will be a change, although he has not ruled out further modifications for future years.

Mr David Aaronovitch, NUS president, said that the union's campaign against the introduction of a new system next year would continue unless the Government announced clear guidelines on future levels of funding and gave guarantees on the independence of local unions. "With all these conditions over the initial total would amount to nothing," he said.

Both Mr Neil Kinnock, the Labour spokesman on education, and Mr Alan Bates, his opposite number in the Liberal Party, are to speak at NUS rallies next week, at a meeting with the local authorities, to discuss the proposed changes. Students' representatives of the Council of Local Education Authorities met Dr Boyson yesterday to discuss their arguments for unions to be

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Technicians' 19.2 per cent honoured

by David Jobbins

University vice chancellors have decided to honour 19.2 per cent offer to their technicians despite the Government's six per cent limit on public sector pay.

The possibility of withdrawing the two-stage, 18-month offer in favour of a flat six per cent was considered at the end of last week. But the offer was not felt to be an original offer not ratified by the technicians because of a fundamental disagreement over an attempt by their employers to impose a national holidays agreement, which the technicians have knowledge that the technicians have industrial strength other workers including lecturers lack.

Despite the employers' insistence on a holidays agreement, the technicians' negotiators are now recommending that the offer should be accepted.

It gives qualified technicians 9.5 per cent backdated to April and a further 8.5 per cent from July next year. Trainees have a first instalment ranging from 8.5 to 9.5 per cent.

The holidays agreement which the employers regard as the price of the package gives technicians a minimum 34 days a year. Where universities offer more than 34 days, there will be no reduction.

The technicians' national advisory committee believes the agreement is the best possible and could not have been achieved without continual pressure and protest action over the past three months. The offer, which is likely to be ratified by technicians, is understood to have been drawn to the attention of the Cabinet.

Ministers and officials were unwilling to discuss university lecturers pay advance of yesterday's meeting of Committee B. But it was becoming increasingly clear that the chances of hanging on to the 13 per cent provisional award which earned after direct talks between the unions and their employers were rapidly diminishing.

There was a general expectation that the Government would attempt to bring the rise, payable from October 4, more into line with the 6 per cent pay target for the public sector.

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Spain after Franco

Senate decides for Lancaster

Lancaster University senate was meeting this week to decide the future of four departments and a regional studies centre, which earlier this year was recommended for closure.

In May a working party chaired by the vice-chancellor, Professor Philip Reynolds, recommended phasing out within three or four years of the Russian, Central and South Eastern European Studies, Arabic and Islamic Studies, European Studies and the North-West Regional Studies Centre.

But the proposals were shelved when the senate decided that the university had not had sufficient opportunity to consider and agree broad strategies for the 1980s. The question was referred back to the senate and a university development committee has now made final proposals.

The original working party report was made after a scrutiny of every department at Lancaster. It was based on the premise that there would have to be reductions in expenditure to match expected deficiencies, and action would be necessary to cope with a fall in the size of the student age-group.

The working party was also concerned about the effect on finances of the Government's decision to charge overseas students full cost fees.

£275m expansion plan for YOP

by Patricia Santinelli

The Government was expected to confirm today that the Youth Opportunities programme would be expanded to take up to 440,000 young people as part of a package of measures for the unemployed being introduced at a cost of between £250 and £275m.

Mr Jim Prior, secretary of state for employment has been fighting for money for such an increase which he sees as a priority in the light of the latest forecasts which predict 600,000 unemployed teenagers by 1981.

Already the Manpower Services Commission has found that its plans to allocate places for 250,000 young people on YOP at a gross cost of £175m had to be revised upwards to take in an unexpected extra 50,000 school leavers.

The Government's decision means that the Manpower Services Commission's wish to change YOP into a more permanent education and training programme is a step nearer.

The commission plans to offer a wider scheme of opportunities, usually lasting a year, which will be geared to all groups of youngsters.

This was highlighted this week in a discussion paper presented by the commission to the Special Pro-

Architecture course may be saved

by John O'Leary

The break-up of the Gloucestershire Institute of Higher Education has brought the prospect of saving a unique course in architecture and introducing a radical new design structure.

Approval for the diploma course at the Cheltenham School of Architecture was withdrawn last year after it had failed to meet minimum requirements for student recruitment two years in succession. The course has been the victim of a moratorium on new degree proposals from the institute imposed by the Council for National Academic Awards.

Initial plans for the institute were thwarted by legal difficulties in uniting local authority and church colleges, so that it functioned as a federation of autonomous bodies. Attempts to overcome obstacles to complete unification were abandoned earlier in the year and two new institutions formed: the College of St Paul and St Mary, and the Gloucestershire College of Art and Design.

Soon afterwards, the CNA granted degree status to a new diploma course in landscape architecture and planning, and hopes were raised for the doomed architecture course. Now a remedial programme has been approved by the College of Art and Design and has won the support of Gloucestershire's chief education officer, Mr Richard Clark.

The new course, which could be launched next year, would raise the architectural standard but would cater for mature students only and would be run on a four-year time-table.

Students would be expected to have worked in architectural practice for at least two years or to have completed an art college foundation course at a selected institution. They would then be required to attend a pre-entry summer school designed to foster links with the community and to assist the colleges for 40 weeks per year.

Mr Graham Powell, head of the department of architecture, said he was confident that the course satisfied validation requirements and, as a resubmitted course, should win approval criteria.

Chilver report runs into new trouble

by Paul McGill

The tide is now running strongly against the Chilver report which recommended in June that Northern Ireland's two Roman Catholic teacher education colleges should merge and move to the site of Stranmillis, the state college, to form a new Belfast centre for teacher education along with Queens University.

The most vehement opposition to the proposals, made by the higher education review group under the chairmanship of Sir Henry Chilver, has come from Northern Ireland. Last week, however, a third education and library board supported the report's main recommendations.

Increasingly the debate has become a choice of chopping either the colleges of education or education faculty at the New University of Ulster and the weight of public comment so far is that NUU should be the victim.

One example of Catholic feeling is that a deputation from Derry presented Lord Elton with a petition signed by 11,000 people, opposing the suggested federation in Belfast and telling the education Minister that he should be prepared to make harsh decisions about other institutions.

The feeling was given voice by the predominantly Catholic Social Democratic and Labour Party at its annual conference this month. It endorsed a resolution approved by the Department of Education which claimed that Chilver gave the Catholic colleges nothing more than protected species status.

The north eastern board sided with the colleges by demanding they should have a predominant role and central role in teacher education and declaring "that teacher training is of such importance in itself that it should not be regarded as a bolt-on to the viability of any institution of higher education".

It added: "The board feels that the review group's conclusion and recommendations related to this matter are, on the contrary, in effect to preserve the position created for the new provider and, furthermore, to do so primarily and disproportionately at the expense of the traditional providers, the colleges, particularly Stranmillis."

The fourth of the five boards, the south eastern, held a special meeting at which opponents of Chilver stoutly argued the Catholic colleges' case. However, at the next meeting, the board decided not to make any submission to the department on the subject.

Eleventh hour reprieve for NELP 62

by David Jobbins

The immediate threat of the first enforced redundancies among polytechnic lecturers has been averted as a result of last-minute talks with national union officials in the face of an about-face threat.

Redundancy notices expected for up to 62 lecturers at North East London Polytechnic on December 31 will now be issued in the wake of an agreement by their employers to allow more time for exploration of a premature retirement compensation scheme, redeployment and retraining in an effort to meet job-shedding requirements.

But notice to the Department of Employment of the intended redundancies is not being withdrawn and both lecturers and their employers accept that the picture will change drastically if there is a further major cut-back in NELP's finances.

An secretary to the joint education committee administering NELP, Mr A. E. Hartley, confirmed that if compulsory redundancies eventually proved necessary there would be no change in the effective date when redundancies would occur—August 31 next year.

Mr Tim Butler, chairman of the Natfhe liaison committee, said: "This is obviously a victory for Natfhe given the fact that the employers were intending to make people compulsorily redundant and this has been withdrawn."

"All along we have argued that reductions can be made by voluntary means."

It is only as a result of Natfhe locally and nationally threatening to take very severe action that the polytechnic administration has been brought back to some sanity.

In a statement to staff after last week's meeting with union officials, polytechnic director Dr George Brown said: "I am pleased to be able to announce that at this time it will not be necessary to declare any compulsory redundancies of teaching staff in 1981-82."

He said that the indication from Natfhe national officials that more time could lead to a solution of NELP's staffing problems without recourse to compulsory redundancy and the 48 applications and serious inquiries about premature retirement "will enable the employer to avoid giving notice of compulsory redundancy."

But he added: "Staff will be aware that the financing of public services will be a continuing problem. There could be no guarantee that implementation of PRC itself would be sufficient to cope with more severe Government action in future."

It was the threat that response to the PRC scheme might not be sufficient which led to the strike call from the Natfhe national executive.

Meetings are to take place next week to assess the eligibility of applicants for PRC—and to decide whether the individuals can be released.

Meanwhile academic staff were late this week attempting to thwart polytechnic plans to close the applied economics department—threatened by omission from the development plan for the 1980s and 1990s.

The polytechnic management's view is that consultations over the development plan ended with the one-day seminar at the beginning of this month, when it was clear that the department—and its well-supported courses—remained the main target.

But Natfhe believes it has safeguarded its right to full consultation on employment implications of the plan, which goes to a full meeting of governors early next month. Union leaders detect a change of emphasis in the plan—that the idea of removing departments now at Waltham Forest to "half-way" accommodation has been dropped in favour of bringing forward new building development and moving courses straight to their final destinations.

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Mature entry needs 'should be changed'

More universities and polytechnics should modify their entry requirements for mature students, a Leicester University professor of education told a conference at North London Polytechnic.

Professor Henry Jones told the conference on adult education in higher education that very little had been achieved to improve the number of full-time mature student entrants.

Opportunities for part-time study have actually declined in recent years, he said. The proportion of mature students in higher education fell from 6 per cent in 1965 to just over 1 per cent 10 years later. Yet 71 per cent of mature students are part-time.

Among the obstacles facing adults wanting to enter full-time study, said Professor Jones, was the prestige attached to full-time study, the preference given to "normal" entrance requirements, and the widely held belief that an increase in the number of mature students would lower academic standards.

But A Levels are unnecessary for mature students and a poor predictor of degree results, he said. In addition research has shown that mature students do better than their traditional counterparts.

Professor Jones advocated modification of entrance requirements, the provision of more part-time and modular study, paid educational leave and more opportunities for transfer of credits between institutions.

The cuts in educational opportunities for adults are a short-sighted, short-term economy which will result in long-term cost, Professor Jones said. He said that the Open University, told the conference.

Kinnock urges more spending

Adult and continuing education should be expanded through a major outlay of public funds, Mr Neil Kinnock, opposition spokesman on education, said in Manchester.

Speaking at a public meeting organised by the Workers Educational Association, Mr Kinnock criticised the low priority given to adult education by the present Government and said specific policy measures should be made to give the central co-ordinating body and the Advisory Council on Adult and Continuing Education.

There should also be an opportunity for mature students to go to university and an increase in the number of places, under which the number of students should be increased between "vocational" and "academic" should be removed. "All education is vocational," he said.

Lecturer wins picket case

A lecturer who lost half a day's pay for failing to cross a picket line to teach has won his case against Middlesex Polytechnic.

When the National and Local Government Association administrators of the polytechnic called a lightning strike in November last year, lecturer Mr John Shaw found a picket line around the building where he was due to teach.

The students were observing the picket line and there was no one there to teach, Mr Shaw said this week.

On the basis that I had not taught the class—even though there were no students there—I was blocked half a day's pay," he said.

Under the grievance procedure for staff, the "joint" education

£5.7m paid back to SRC

The Science Research Council has now been officially informed that it is to receive a total of £5.7m, more than 50 per cent of the cash saved from its contributions, this year to CERN, the European organisation for nuclear research.

The Department of Education and Science has told the council that Treasury has agreed to provide it with the money, the result of savings made because of the strong pound. The SRC had hoped to keep £5.7m earned this way, but was first told it would not be getting all of the cash, although the Treasury has now agreed to give the council most of the money, following an appeal made on its behalf by the DES.

The cash should prove crucial in funding the SRC out of its present dire financial straits, for without the £5.7m for the 1980-81 financial year, several projects would have had to be abandoned, particularly a major programme of research and development in construction at major science centres. These will still take place, although they are now expected to last only a few months.

Boyson letter saves teachers' advice service from closure

The threat to the London-based Teacher Education Advisory Committee, due to close next Spring, has been lifted after a letter of support from Dr Rhodes Boyson, under secretary of state at the Department of Education and Science.

The letter, which stresses the importance of the committee, has been sent to the three of the sponsors, the Council for National Academic Awards, the Institute of Education, the University of Sussex and the London Regional Advisory Council, that the committee's life should be extended to at least 1982. The fourth sponsor, the Council for National Academic Awards, has not yet confirmed that it will continue funding the body.

TEAC, which emerged after the second wave of teacher training rationalization, was formed to coordinate teacher training in London and the Home Counties and fill a vacuum created by the demise of the area training organizations.

Initially it came together as a two-year venture in the expectation that during this time the DES would have set up regional machinery to embrace teacher education.

However, lack of initiative from

Allocation plan for poly fund pool

by Peter David

The Government has at last decided how to distribute funds to polytechnics next year from the "capped" Advanced Further Education (AFE) pool, the central fund which allows universities local education authorities for their higher education spending.

At the last meeting of the Department of Education and Science working group which has been investigating the problem, civil servants made it clear that the Government would not pursue attempts to introduce national standard costs for students in the maintained system of polytechnics and colleges.

Instead, the DES intends to opt for a three-part scheme designed to mitigate problems caused by the admission placed on the AFE pool.

Under this scheme big increases in local authority rates will be avoided by a complex system of "mitigation", aimed at sharing any rate increases among all local education authorities. In addition, spending per student in individual authorities will be "frozen" at their historical level and the distribution of funds from the AFE pool will be adjusted at the end of the year, to correct any errors.

Polytechnics and colleges will not know how big their budgets will be for 1981-82 until the Government has determined the overall size of the pool. An announcement is expected soon by the DES, which has been postponed until early December.

The DES working group, chaired by assistant secretary Mr Stephen Jones, is however continuing to try to devise a new method of funding for later years. It would attempt to lay down national cost norms for students on different courses.

In a confidential paper considered by the group at its last meeting, Dr Peter Knight, a union representative, laid down the conditions any unit cost system would have to fulfil. The paper argued that any new system should ensure that colleges and polytechnics would not be discouraged from running high-cost courses.

Dispute over reference settled

by John O'Leary

Arbitrators have settled a long-running dispute over the alleged interception of a request for references by a college principal.

The case, which had also been examined as part of an inquiry by the Inner London Education Authority, centred on complaints by Mr Harold Trace, a former head of Department at the South West London College, about the conduct of the college principal, Mr Lyndon Jones.

His allegation that Mr Jones had intercepted a request for a reference addressed to his late vice-principal, Mr Norman Hubbard, was dismissed, although it was accepted that the letter was marked "confidential" and addressed to Mr Hubbard. Since the letter was opened by a secretary and brought to Mr Jones' attention, members of the National Union of Teachers' panel found that there had been no interception.

The arbitrators also rejected Mr Trace's claim that unfavourable comments attributed to Mr Hubbard in the subsequent reference written by Mr Jones constituted malice since they were, in various views expressed in previous references, seen more favourable comments in previous references by Mr Hubbard, his action would have been quite wrong.

Even without such knowledge, the arbitrators said, Mr Jones acted unwisely and, albeit unwittingly, left Mr Trace with a feeling of grievance.

They found that Mr Trace had been guilty of defamation in making his allegations of malice but made no award of damages. Both Mr Jones and Mr Trace, who is now assistant principal of the West London Institute of Higher Education, have applied to the lecturers' union, Natfhe, for reimbursement.

Over the sea to Scotland?

English colleges are apparently transfixed into "overseas rule".

A Scottish office statement adds that it has already made strong representation to the Department of Education and Science urging local education authorities to stop using Scottish students by "this inaccurate terminology". Agricultural college authorities who now appreciate the position will in future use the phrase "economic rate".

A puzzled spokesman from Durham said that the regional office had been told that some students from outside the college area, said a spokesman. However, the term

John O'Leary

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North American News

Huge rise in overseas enrolments

from Clive Cookson

WASHINGTON
Citing an "astounding" increase in foreign students at American colleges and universities and the attention focused on them by President Carter's crackdown on Iranians studying in the United States, the American Council on Education (ACE) has set up a special committee to assess the impact of overseas students and to recommend policies for dealing with them.

The council deliberately made its announcement on the first anniversary of Mr Carter's order to the Immigration and Naturalization Service to interview all 50,000 Iranian students in the United States and expel those who were not in compliance with their visas.

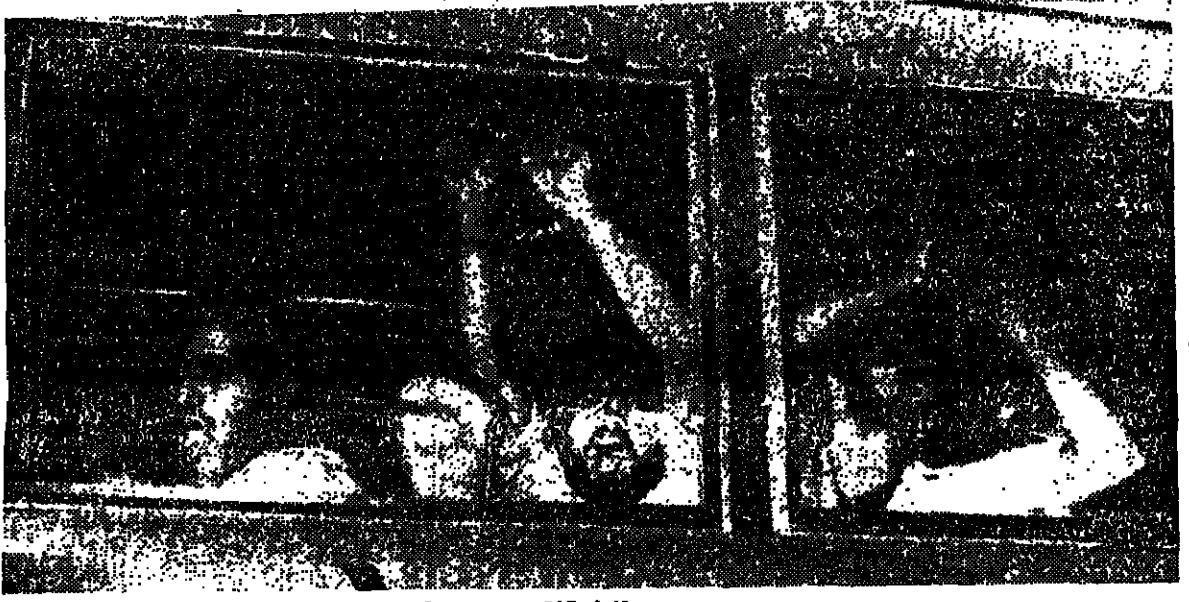
That order and other hostile responses to the seizure of the US embassy in Tehran have created a climate of some urgency for the deliberations of the committee, said ACE president Jack Peltason. "We believe the sense of imminent crisis is greatly exaggerated, but that it provides a good occasion for improving present deficiencies."

The most recent data from the Institute of International Education in New York show a total of 286,000 foreigners enrolled in American colleges and universities in 1979-80. That is 8.5 per cent more than 1978-79 and almost double the level of 1974-75.

Richard Berendzen, who will chair the new ACE committee, said this year's total was at least 300,000, and he quoted some projections that the figure could reach 750,000 "within a few years."

Both Dr Berendzen, president of the American University in Washington, DC, and Dr Peltason, president of the University of Wisconsin, emphasized that they did not want to suggest that the overall number of foreign students was too high or that American colleges and universities would not welcome more. They were just concerned that many institutions were not prepared to cope with the increase.

Indeed, Dr Peltason said some universities do not have enough foreign students to achieve their stated institutional goals. Others "have too many," in the sense that they are financially overdependent on a flow of foreign students that might suddenly be restricted by



Protesting Iranian students are taken to a US jail.

political or financial factors.

Everyone in the American educational establishment is horrified by the thought of government restrictions on foreign students, whether by discriminatory fees or by quotas. In an aside at the press conference introducing the ACE committee, Dr Peltason mentioned the recent actions of the British government with a shudder of distaste.

Motivated by the Anti-Iranian backlash, numerous state legislatures have considered legislation to restrict enrolment of foreign students. But John Reichard, executive vice-president of the National Association for Foreign Student Affairs, said most of the laws were still at the discussion stage. For example there is talk in terms of making foreign students pay "100 per cent full cost," and Mr Reichard said that would mean a five-fold increase on the out-of-state fees charged currently by state colleges and universities.

Dr Peltason said his committee of 12 academic leaders would try to give institutions guidance on all major problems concerning foreign students "from the profound to the mundane." In the former category he put the ethics of re-

cruiting students abroad—the "truth in advertising" issue. In the latter is the practical problem of making arrangements for foreign students during the Christmas break, when the campus may be closed and the American students have gone home to their families.

The fears and tensions of the hostage crisis seem to have made a deep impression on universities with large enrolments from Iran. When anti-Iranian feelings were running particularly high at the end of last year the American University would telephone 20 other institutions three or four times a day to coordinate a contingency plan," Dr Berendzen said.

He added that the threat to the Iranians came not from their overwhelming sympathy to their plight, but from outsiders. Dr Berendzen did not say exactly what his contingency plan was, but he said there is still a possibility that the American hostages might be harmed and then the plan would be needed—but it apparently involved hiding the Iranians away.

So far, however, "the overwhelming majority" of Iranians in

the United States have been able to continue studying normally over the past year, according to Dr Berendzen, despite tremendous personal and financial pressures and what he clearly considers excessive "harrying" by the Immigration and Naturalization Service.

The Institute of International Education's statistics show that 35 per cent of all foreign students come from OPEC countries, and their numbers are increasing at three times the rate of non-OPEC students.

Engineering is by far the most popular field of study for foreigners. Twenty-nine per cent of overseas students in the United States are on engineering programs, followed by 17 per cent studying business and management and 9 per cent specializing in the natural and life sciences.

California is their favourite state: it has 48,000 foreign students, followed by New York and Texas with 24,000 each. The two single institutions with most students from abroad are in Los Angeles: the University of Southern California has 3,300 and Los Angeles City College has 3,000.

Closure of press averted

from Guy Neave

Academic publishing in Canada has received a shot in the arm from two separate developments. The threatened closure of the McGill-Queen's University Press has been averted, and the University of Toronto Press is considering a plan to set up a new press of its own.

The McGill-Queen's University Press, the second largest in English-speaking Canada, has been under threat since last summer by a new arrangement with the University of Toronto Press. The latter will provide all the services that follow after a contract with an author has been signed—copy editing, proofreading, marketing and distribution.

But McGill-Queen's will retain its own board of directors and editorial advisory committee, and it will remain entirely responsible for commissioning and accepting manuscripts for publication. The press, founded by McGill University in Montreal and Queen's University in Kingston, Ontario, in 1968 as a joint publishing house, will continue to issue its own catalogues and in books will retain a separate appearance and identity, according to the agreement with Toronto.

In May McGill and Queen's would have to suspend operations in 1981 "because of serious financial problems." They say now that the new agreement will enable them to continue publishing because it will cut the operating subsidy required from each university by 50 per cent.

The University of Toronto Press is pleased too, because it can now expand its production role and benefit from economies of scale in the publishing business and management and 9 per cent specializing in the natural and life sciences.

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Overseas News

French resistance for reforms

from Guy Neave

PARIS
Proposals to change the make-up of university councils are meeting stiff resistance. Over the past four months 29 of France's 76 universities have refused to implement the new regulations.

The reforms, introduced last summer by the centrist senator Jean Sauvage and backed by the Minister of Higher Education Mme Alice Saunier-Sieff, increase the number of shareholders on each university council. Professors now form half the membership compared with 30 per cent under the 1968 guidelines. As a result the number of places reserved for representatives of non-professional teaching staff and students has been spectacularly reduced.

The change has received little support from the university world. It is seen as whittling away the principle of participation by junior members of staff. The new law due to take effect from September 1 has been heavily criticised by the Minister of Higher Education as a "recognition of excellence" quite apart from increasing the influence of senior faculty members thought to be more favourable to the government.

Speaking to a minority student organisation recently the minister

justified the new legislation on the grounds that it gave Liberals a chance to be heard against what she sees as the too powerful influence of the Communist Party in university affairs.

Though the minister has felt for a long time that higher education is dominated by small and unrepresentative left wing groups, her attack on the *Spéciale Nationale de l'Enseignement Supérieur*—the major lecturers union—has increased more than just members of the Communist Party.

Widespread refusal to modify the composition of university councils has placed the minister in an embarrassing situation. Two university presidents have already resigned over the issue—one at the University of Lille 3, the other at the University of Upper Brittany.

Considerable pressure was brought to bear on M Michel Denis, president of Rennes 2 in an effort to persuade him to withdraw his resignation. His refusal, backed by all members of the university council has forced the ministry to appoint an outsider to act as stop-gap replacement. This step has merely reinforced the impression of arbitrary intervention by central government in university affairs.

More significant in the long run



Mme Saunier-Sieff: backed reforms

Commission hopes to learn from Britain

New budgeting methods must be found to allow French universities greater autonomy and greater responsibility in running their own affairs. This was the call made last week by Prime Minister Raymond Barre at the setting up of an eight-man commission to investigate ways of introducing greater financial flexibility in French higher education.

The commission, headed by M Yves Preville, professor at the University of Rennes, has been given a wide remit. Its first task will be to examine how higher education is financed in the major European countries. This information will be used to make a preliminary study of the French context of the reform in financing French higher education. The commission will have to work fast as it is due to report back at the end of February.

The change is thought particularly significant. The commission's decisions will lead to a policy statement scheduled to take place

slightly before the presidential elections in April next year.

The commission's task is to draw up a series of criteria that will enable the government to finance each institution higher education on a global basis rather than the present system of closely earmarked and controlled grants. All sources of finance are to be reviewed including the possibility of research contracts with private industry and even donations from private individuals.

Members of the commission have been asked to consider whether student grants should be tied to a particular institution rather than to the student nationally. Equally radical in the French context is the issue of whether universities should not have the right to fix their enrolment fees. This has been a long practice in certain private sector grandes écoles and in some universities.

Speaking to members of the commission last week, the premier

said that not all foreign models of financing higher education could necessarily be applied to France.

Particularly interesting he suggested were the systems current in operating in West Germany and Britain. The British method he reckoned was especially promising. It combined a high degree of university autonomy with grants covering almost exclusively from central government.

Whatever the new system, he went on, it should ensure that if the state provides the essential backing this backing should not degenerate into the virtual subordination of the university to the state. Part of financial autonomy would be thought give universities greater room for manoeuvre. Far more to the point it would prevent them relying too much on a ministry which would not provide the resources expected was that subject to the most unkind criticism from the academic world.

Chinese link for academics

The People's Republic of China is considering setting up a new Chinese-English university with the help of American academic leaders.

When Martha Meyerson, president of the University of Pennsylvania, visited China in August, his primary purpose was to explore the possibilities of establishing a bilingual Chinese-English institution in the People's Republic. Jerome Wiesner, who chaired this year as president of the Massachusetts Institute of Technology, has also been approached by the Chinese.

Dr Meyerson said the project was still "in the glow of the eye," whose implementation probably lay some years in the future. But he expects to be involved back to China for further discussions in 1981.

"The major question now hanging over the project seems to be the financing," Dr Meyerson said. Chinese officials hope that part of the money will be contributed by the English-speaking world—the United States, Canada, Britain and Australia. Contributions from those countries, which do business with China, could be a fruitful source of funds.

Prestige college increases goal for fund-raising campaign by \$25m

from our North American editor

WASHINGTON
Dartmouth College has increased the goal of its current five-year fund-raising drive, which still has two years to run, from \$160m to \$185m.

A decision by a college or university to raise its campaign sights before reaching the original target is extremely unusual, if not unprecedented, and the fact that Dartmouth has taken it may be interpreted in two ways.

It can be seen to symbolize how well voluntary giving to academic institutions is holding up during the current recession. Or, more realistically, it may acknowledge the adverse effects of inflation on college funds and gifts.

An interview with Assistant Vice-President for Development in charge of the college's fund-raising drive makes clear that both factors are involved. "In view of the extraordinarily high rate of inflation and the fact the campaign is running ahead of schedule, we decided to raise the target by \$25m, which will all go to the endowment fund," he said. That will add a total of \$105m to the endowment, instead of \$80m under the original plan. The remainder of the gifts will be used for operating expenses, to improve facilities and so on.

On a per capita basis, Dartmouth is the most successful fundraiser of all 3,000 colleges and universities in the United States. That is true, Mr Wiesner says, whether you measure the total number of gifts or their aggregate value. An average of 62 per cent of all Dartmouth students give money annually to their alma mater.

According to Dartmouth's

board of trustees, even at Dartmouth, high inflation during the 1970s has seriously undermined the real value of the endowment. Income from the endowment fell from 23 per cent of the total operating budget to 12 per cent during the decade.

The current "Campaign for Dartmouth" began in 1977. The college's needs were projected on the basis of 7 per cent inflation. In the event, costs have risen at nearly twice that rate.

The trustees of Dartmouth were also inspired to go for the additional \$25m because Robert Maxwell, a retired businessman, had just given them \$10m—the largest donation ever received from a living alumnus.

Mr Wiesner, who is very familiar with other institutions' efforts to raise money, believes prestigious colleges and universities "are enjoying a good climate for fund-raising. But I guess we must have to add that as one foot there, the line towards more marginal schools there must be an awful lot who are struggling terribly."

Less successful colleges are having to put a far higher proportion of their gifts to work immediately, he says, "because their endowments are being eroded by inflation. They must benefit from a fund-raising campaign that they need to attract money."

No one has ever defined the "mythology," he says, "of just accept our good fortune and believe in the power of the dollar. It's a very real thing. When you see the erosion of loyalty, 800,000 living alumnus do regular voluntary work for Dartmouth. 3,000 are involved in fund-raising and the new help interview, and recruit potential students."

Dartmouth's fund-raising approach is kept deliberately conservative, and Mr Wiesner is understandably wary of gimmicks that might upset such a successful operation. One of the few recent innovations came about 10 years ago, "when we decided that we would talk to the better-graduated about the responsibility of being alumni," so we instituted a series of "alumni dinners."

"The old tradition was that you didn't talk to undergraduates about being alumni. They just absorbed the loyalty. But at the peak of the 1960s campus turmoil we decided we could no longer leave that to chance."

Fund raising campaigns at other colleges and universities are also coming along well. For example Carnegie-Mellon University announced last month that it exceeded its three-year \$100m campaign by \$3m. As a group, industry gave most to the campaign.

Cornell University also proclaimed last month that its campaign—\$230m over five years—had been completed successfully, just 10 weeks ahead of schedule. More than twice as much of the campaign as in the first two years is in the final months of a five-year \$265m campaign, which is expected to surpass its goal "significantly."

The University of Pittsburgh, which announced a \$50m five-year campaign in April, is doing so well that it may reach the halfway mark as soon as January.

Illinois Institute of Technology is far ahead of schedule on its 10-year campaign started in May 1979. It already has nearly half of its \$100m target.

Amherst College has just launched a \$30m five-year campaign.

Cambridge graduate at centre of theological storm

from James Hutchinson

A British woman student at the West German University of Tübingen is at the centre of a theological cause célèbre. Miss Sheila Briggs is a Roman Catholic but wishes to take her doctorate in Protestant theology. This has caused a widely publicized theological fuss over the right not to keep with the canonical spirit of the university.

Miss Briggs, who began her studies at Cambridge, has been at Tübingen since 1976. She spent three half-year terms in the Catholic theological faculty before switching to the Protestant department. She had become particularly interested in the teachings of Karl Barth, the only Protestant theologian. He was sought in twentieth-century Protestant theology by his uncompromising advocacy of the traditional Christian motifs of divine grace and freedom.

But at Tübingen apparently there is no limit. Miss Briggs, who now has a scholarship from the

World Council of Churches and is writing her dissertation on the "Theological Anthropology of Woman in the Teachings of Karl Barth," was told in the summer of 1979 that she was not able to take her doctorate.

She appealed against this decision, and the result of her appeal will be made known towards the end of November. She thinks it will not be upheld but she will not give up the fight and intends to take her case to the university council.

In her view, her rejection by the Protestant faculty is a violation of the constitutional freedom of research and teaching.

Miss Briggs, oddly enough, is now a research assistant in the Protestant faculty at Tübingen. It has been suggested to her by many people that she could convert to the Protestant faith. She will not do so, and prefers to continue working for the ecumenical movement. The Protestant newspaper commented: "The Anglo-Saxons learn to tackle problems pragmatically... this virtue can create problems in our complicated academic system."

High pay for professors

Australian university professors and heads of schools at colleges of advanced education continue to be among the most highly paid professional groups following the latest academic salaries tribunal award by the Australian Industrial Relations Commission. The tribunal awarded by the academic salaries tribunal professors and heads of schools will receive A\$39,000 (£19,500) a year. The salaries of associate professors or readers in the universities and principal lecturers in colleges will go to A\$32,500. The maximum salary for a senior lecturer rises to A\$29,000 and for a lecturer to A\$24,200.

The interim increase will take the starting salaries of tutors to A\$13,000 and the maximum for a senior tutor to A\$18,000.

Vice-Chancellors, their deputies and heads of colleges will also receive an increase. The basic award for vice chancellors in the larger universities will move around A\$50,000 but most receive much more in allowances, housing and transport. The maximum salary paid to directors in the college system will go to nearly A\$46,000.

The salary rise will put further strains on the financial administrations of Australia's tertiary institutions, already struggling to cope with three years of government cuts in funding.

At Sydney University, for instance, the vice-chancellor, Sir Bruce Williams, has announced that the number of full-time academic staff will have to be reduced by about 20 in 1981 and the overall staff numbers cut by about 40. Sir Bruce said the cuts were necessary because of the steady decline in the real value of the recurrent grant from the commonwealth government and rises in costs not covered by indexation.

Student numbers reach record level

An unexpected 3 per cent increase in student numbers in the United States to their highest level ever, according to the government's National Centre for Education Statistics, gave a preliminary thrust for the year 1980-81.

The National Centre for Education Statistics gave a preliminary thrust for the year 1980-81. The number of students in American colleges and universities increased by 3 per cent over the previous year, to 20.9 million.

SPECIAL ANNOUNCEMENTS

The Ivan Morris Memorial Prize

The British Association for Japanese Studies invites entries for an essay prize in memory of the late Professor Ivan Morris. The value of the prize is approximately £200 and the competition is open to all undergraduates in Universities and Polytechnics in the United Kingdom. The subject for this year's essay is "Japan's Most Important Influence on Europe in the Past 100 Years". Entries should be typewritten and no more than 4,000 words in length and should be sent to Dr G. Daniels, Japanese Studies, The University, Sheffield S10 2TN, by the 31st January, 1981.

Robin McKie on the stringencies facing West Germany's Ministry of Research and Technology

Not even miracles can counter science cuts

In a country apparently blessed by economic miracles, it is perhaps surprising to learn that even in West Germany scientists are facing the prospects of a struggle for limited funds. Yet for all its industrial strength, Germany now faces a time of Thatcher-like cuts aimed at controlling inflation and easing pressures on the domestic market.

In the process, science has found itself a political victim because in the past few days, German ministers have agreed to fix the 1981 budget of the Ministry of Research and Technology (the *Forschungsgemeinschaft* or BMFT) at a mere DM6,100m (about £1,350m). This sees an incredibly large amount of money by British standards, although it includes research funds that would spread between many different ministries.

The total also represents a considerable drop from the previously planned DM6,850m and further cuts are quite likely to be imposed when the budget is presented before the German Parliament.

Much of the trouble has come from political rows within Germany's coalition government. When the Finance Ministry announced that major cuts in expenditure, including tax increases, were to be introduced at various ministries, the minority liberal FDP party complained bitterly that their party's three ministerial posts—foreign, agriculture and economics—were being unfairly selected for severe cuts by their coalition partners, the social democrat SPD party.

Their flight to save cuts in their departments resulted in a search for other victims and one of those found was the BMFT research ministry, which has always been seen as a major rival to the ministry of economics, a department famously equivalent to our Department of Industry.

The cuts now imposed mean that over the period 1979-81, the BMFT's budget will rise from DM5,550m to DM6,100m—a rise

of less than 10 per cent over two years, assuming that Parliament does not make further reductions. This figure is slightly below even Germany's restrained inflation rate, and given that salary and equipment costs have risen disproportionately in science, cuts are now unavoidable.

"It means that this ministry cannot now fulfil and cannot serve the plans we have set up," said Dr Joseph Remberger, head of research policy and finance at the BMFT. "Some hundreds of projects will have to be reappraised and many will not be realized."

One particular group of victims will be university teams working in close collaboration with industry on applied research projects—a move which would hurt German scientific pride quite badly, for a philosophy held dear by the BMFT, and through it the German government, continually aims to force scientists to seek commercial applications for their work and industry to take them up.

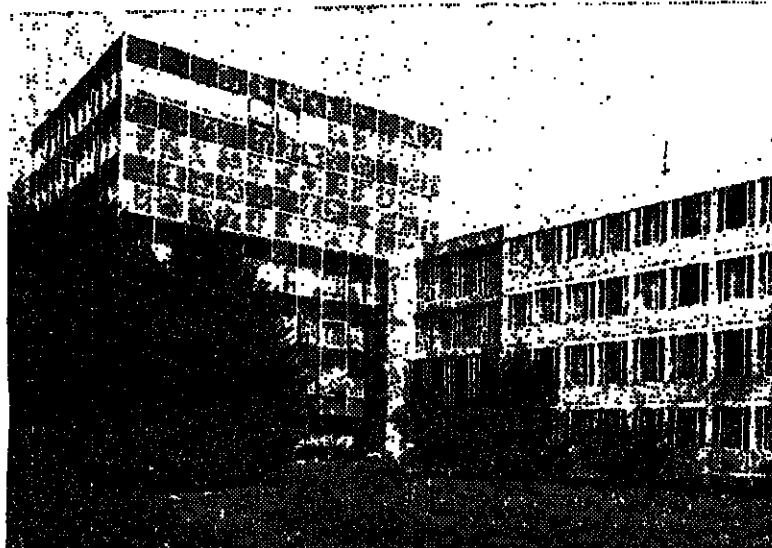
Yet there is little else that can be done, for the BMFT budget is split three ways:

● Funding of international agencies, such as CERN, the European nuclear research organization, and the European Space Agency. These account for 10 per cent of the total.

● Financing of research institutions, such as Germany's Max Planck Institutes, which in total take up 40 per cent of the budget.

● Project promotions to support research in universities and industry, both separately and jointly. These account for the remaining 50 per cent of the budget.

The first two sections are difficult to cut and so the last fraction will bear the brunt of cuts. A part of this will include the BMFT's joint university-industry promotions for which the universities receive 100 per cent financial support, while the ministry and companies receive 50 per cent. In the past these ventures have produced valuable work on reactor safety research, materials analysis, new micro-



The headquarters of the Forschungsgemeinschaft.

electronics circuit designs, and improved solar energy collector designs. There are now several hundred such projects, although future numbers are now hard to predict in view of the projected cuts.

However, the BMFT is now expected to increase pressure on industry to take on greater investment in energy research—which already accounts for 38 per cent of the research ministry's budget. "If major companies are not willing to take over, in the long term, a larger section of research into major projects, such as solar energy research and work on high temperature and fast breeder reactors, then we will have to think if one of these areas might not have to be cut," added Dr Remberger.

In general, the cuts will fall harder on industrial applied research but given that the BMFT controls DM2,800m or 35 per cent of Germany's research and development, university research—compared with the DM6,500m contribution of the DFG, the nearest equivalent to the United Kingdom's Science Research Council—then harder times are in store for university researchers.

The crisis of staff stagnation

University staffing levels are a perennial problem in Europe, higher education and a major headache among them is the crisis of staff stagnation. A recent report by the European Science Foundation warned there was now a danger of "irreparable" loss of research talent in Europe because too many academics were in the younger age groups, and new recruitment was often far below the 3 per cent per annum required to put this right.

One of the worst examples highlighted was West Germany, which is likely to provide only about half the rate of replacement demanded. To counter this, the Remberger scheme, named after the noted German physicist, was introduced to provide new research posts and increase the academic pool by 1 per cent a year.

Sadly it has proved to be anything but a success. This can be judged quite easily from the scheme's figures. A total of 150 posts were to be offered each year from 84 last year only 57 applications were considered good enough to fill the posts. Indeed, a maximum of 19 posts were to be introduced over a five-year period—but last year only 117 had been filled.

The reasons for the poor response are not hard to understand. In Britain's special case, the following factors have been identified: leaving posts to conduct research does not provide a career path for young workers, the German scheme directly provides places for young researchers aged less than 35 years. Given that a PhD is 27 in Germany, this gives a promising young scientist little time to gain a high reputation and research output sufficient to satisfy the Deutsche Forschungsgemeinschaft (the United Kingdom's Science Research Council) that they are worthy of a post.

Worse than that, the posts are limited to only a five-year tenure in some non-advanced further education and in the examination of some of them, performance is as far as full-time courses in advanced further education are concerned they are merely an extra layer of bureaucracy to inhibit decisions about courses which draw students from the region, which are nationally validated, and in which 30 per cent of students' support comes from the central Government.

John O'Leary spotlights a set of targets for the Select Committee on Higher Education

An abolitionist wind blows towards the regional councils

It might appear to the cynical observer that the generally favourable response to the Select Committee's report on higher education reflects the near absence of economic argument to tamper with the authority of existing organizations. The committee may demand changes in attitude or marginal alterations in role, but few bodies will feel threatened by its proposals.

The major exceptions to this rule are the regional advisory councils, which the Select Committee regards as a necessary bureaucracy and wants to see abolished. In an attempt to speed up the course approvals system in the public sector, the committee has recommended the abolition of the Regional Staff Inspectors. Her Majesty's Inspectors and the RACs would all lose their interest in higher education.

However, whereas Miss Sheila Browne, HM Senior Chief Inspector, told the committee her department did not relish their current involvement, no such feelings were forthcoming from the RACs. Miss Browne said she found the system unsatisfactory because inspectors' time was taken up with work additional to their normal function and they had conflicting roles to play as a result.



THE PRICE REPORT

The Standing Conference of Regional Advisory Councils, on the other hand, saw their members forming the core of a new system of planning along the lines proposed by the Oakes Committee. The combination of central planning by a new regional body and an independent institutional autonomy which emerged in the report is less from SCRA's ideal.

The committee said of the RACs: "We believe they play a useful role in some non-advanced further education and in the examination of some of them, performance is as far as full-time courses in advanced further education are concerned they are merely an extra layer of bureaucracy to inhibit decisions about courses which draw students from the region, which are nationally validated, and in which 30 per cent of students' support comes from the central Government."

Some of their activities in fields outside higher education might need to be taken over by new, smaller organizations, the report said, but the councils themselves should be abolished.

Although the Department of Education and Science has said it is maintaining the course approval system, which Mr. Mark Carlisle, Secretary of State for Education, agreed was primarily negative, it will be the local authorities which make any decision on the RACs' members. They fund the councils and provide the majority of their membership.

The oldest of the RACs have been operating for 50 years, initially as an informal grouping of local education authority representatives, but in 1946 that the existing network was established. In 1957 a DES memorandum gave them their responsibility for "ensuring economy and efficiency" in the provision of advanced courses.

The nine English and one Welsh councils have already very considerably increased their role in the responsibility for course approval. The largest, covering London and the Home Counties, considered proposals for more than 600 courses last year, many of which involved the reorganization of existing courses for amendment. The average workload was over 200.

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more likely to be connected with validation than the granting of RAC approval.

Most RACs expect to process a proposal within three to four months of receiving it, but the local authority before passing the successful course on to the Regional Staff Inspector. The council is concerned with the suitability of the institution to run the proposed course, the prospects for student recruitment and the existing provision within the region. Judgments on the quality of the course are left to the validating body.

Although the large majority of modified courses resubmitted to the RACs are accepted, only about 60 per cent of proposed new degrees are supported and only some 30 per cent get past the RSJ, who is charged with applying the DES's guidelines.

The councils are also expected to monitor student numbers on courses throughout their region, making recommendations to local authorities on closures where necessary, as well as carrying out the extra responsibilities some have as examining authorities, running conferences and providing statistical information.

It is an unglamorous and potentially unpopular role which has already started to undergo an upheaval in some parts of the country. The East Midlands RAC only narrowly survived a proposal to slash its budget by half, escaping eventually by a 20 per cent vote. While the Yorkshire and Humberside council has been completely revamped in an attempt to achieve the objectives set by the Oakes Committee.

However, the RACs have some powerful supporters, who are unlikely to support moves to dismantle the system. CLEA was quick to come to the aid of the East Midlands council and can be expected to resist any attempt to put the Select Committee's recommendations into practice. The councils provide a valuable buffer with the institutions and the DES at relatively low cost.

The committee seemed to accept criticisms of the RACs made by polytechnic directors and college principals that they were too negative and contributed to an excessively slow course approval procedure which militated against the public sector when there was a need to react swiftly to a perceived need. Mr David Bethel, then chairman of the Committee of Directors of Polytechnics, said the councils had no real planning mechanism and merely reacted on the basis of incomplete information to institutional initiatives.

However, the councils would argue that this was precisely what they were intended to do and that the main delays in starting a new course in a college or polytechnic were

One step forward, two steps back by Boyson

Paul Flather describes the predicament into which the Union Secretary of State for Education has got himself over the question of student union finance

If there was one manhole Dr Rhodes Boyson did not expect to fall down when he was appointed minister responsible for higher education, it was the deep but narrow shaft of student union finance. Of course there were details to be worked out, but the spadework had been done by the previous Labour administration, and the principles agreed by all parties. This surely would not prove too taxing a job.

Perhaps that has been half the problem. The principle that under the present system student union spending lacks accountability is accepted by students, local authorities and University Grants Committee officers. But devising a new system has proved difficult. So difficult that the Government is subtly preparing to abandon its stated intention to fund student unions from the recurrent grants of institutions and settle for a funding system operated through higher tuition fee levels. A late stop forward by the Department of Education and Science has produced two steps back.

The current debate dates from 1978 when the Public Accounts Committee roundly criticized the "open-endedness" of student union spending. At that time, the present system of student unions agreed a subscription fee per student (capitation fee) with the parent institution to cover all union services. All local education authorities sending students to that institution then automatically have to pay that fee. It was simply being pre-empted by student unions, the argument ran.

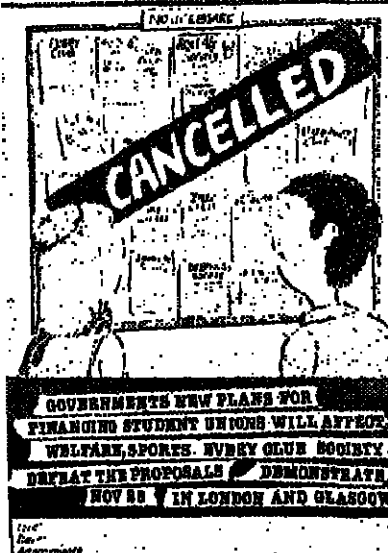
In response, Labour produced a consultative paper outlining various alternative schemes. The DES plumped for a two-tier system based on a fixed maximum amount topped up from the recurrent grant. The Council of Local Education Authorities (CLEA) preferred a scheme where the total income was negotiated annually within the institution.

But the change in Government in 1979 began consulting on the alternative systems, and quite suddenly on February 5, Mr Mark Carlisle, the Education Secretary, announced that student unions would be financed from 1981-82 by the DES. The effect will be to treat unions as one of the normal facilities provided for students in institutions of higher education.

With the clock now stopped at one minute to midnight, so to speak, DES officers are still discussing the finer points of the new system, more than nine months after Mr Carlisle's announcement, and well after the Rata Support Grant Scheme has already been put in place. It has also been tracked so that it will be tidied up and not recurrent grants that now play the critical role.

This vacillation and pusillanimity explains why Dr Boyson now faces stiff opposition on two fronts: one which would have been an easy issue. First he faces opposition from the National Union of Students who have called the "biggest campaign in a decade" to defend the autonomy of student unions. The second, at least in theory, by the new rules. Their campaign culminates next week (November 28) with national demonstrations in Glasgow and London. The NUS are demanding a one-year postponement of the new rules, something Dr Boyson says is out of the question.

On the other front are the CLEA officers, who have been warning of impending problems throughout the



summer, as indeed have the NUS. Of course CLEA can hardly take to the streets, but they have shown their concern by the apparent lack of concern by DES officers in dealing with these problems, in spite of the flurry of recent meetings between the two sides.

So what precisely are the problems? First there is a dispute about the average amount of money the DES is to hand out per student in the first year; then there is a dispute on the mechanism for transferring this money from central funds to institutional funds; then there is a dispute about how different types of student pay their fair share; finally, there is a dispute about how potential rows could be avoided or solved.

The NUS took the DES statisticians to task about the calculations used to arrive at a figure of £32 per student average to be transferred from central to institutional funds in the first year. Dr Boyson has agreed to revise this figure, probably up to about £37, accepting that the NUS had the best data to calculate an average fee. Even so it was well below the NUS's estimate, adjusted for inflation, of more than £40 for 1980-81. This, however, is not proving too much of a sticking point.

Transferring an average fee per student to institutions leaves the problem of adjusting the figures up or down depending on the actual fee was below or above average. University fees vary from £22 to £71 (some Oxbridge colleges go up to £77), polytechnic fees vary from £27 to £60, colleges of education from £35 to £60.

The University Grants Committee has told vice-chancellors that it will indicate how much has been included in the current grant allocation for student union fees. CLEA feels it is a "heads you win, tails I lose" game. If the figure is below average they will be asked to spend the excess on the union, and if it is above, they will have to "find" the extra.

The final problem remains the most controversial—both CLEA and NUS want some general guidelines to ensure the system achieves its end of reconciling greater accountability with the current degree of student union autonomy. NUS fear that with student unions negotiating for their funds "locally" within institutions and with L.E.A.s they may get squeezed out, if priority for example is given to new library books, a new sports ground or perhaps a bigger canteen. It fears unions will not get access to areas of "reserved" business in colleges and universities to argue their case for funds; and it fears that reserves of funds built up for trading could be dissipated for the wrong reasons. CLEA wants a clear procedure so that local problems can go to appeal and be solved.

Dr Boyson is reluctant to be drawn on such guidelines. He says if student unions do a useful service, providing sports or debating societies, they will survive if they can justify their role, then one can "trust" the purpose.

The manhole is looming very large at the present: two polytechnic students unions, Middlesex and Brighton, have already accused their authorities of interference in union affairs, derived from control of their purse strings; and the council at Bristol University is supporting student demands for a postponement of the new rules. But that is not negotiable in Dr Boyson's words. The new rules will be introduced and there will be no turning back. The best option to this story is provided by the NUS president Mr David Aaronovitch, who said: "It is a conflict that could so easily have been avoided."

Günther Kloss on the cause and effect of a crucial development in German universities

The Numbers Game: when the quota system had to start

In 93 centres throughout the Federal Republic on August 12, 1980, almost 6,000 applicants for a place in one of West Germany's 28 medical, 20 dental and four veterinary medical schools sat an examination to determine their suitability and ability for their chosen course. No one did so compulsorily, yet some 80 per cent of the 37,000 applicants for these three subjects expressed the wish to be part of the examination.

This autumn, 1,200 places (out of a total of 9,000) have been allocated on the basis of the results of these tests, although no one of the participants who failed to qualify was excluded from the "normal" admission procedure.

Entrance examinations are a novelty in German higher education. This is why the tests are themselves monitored over a period of three years before the Länder ministers of education will finally decide whether in future the admission of students to these three subjects, which have more applicants than places than any other course, should be primarily based on the results of such tests.

The introduction—even on a trial basis and in only three subjects—of a quota system has led on the road to university medicine further step away from what is still regarded as a fundamental right of all qualified German grammar school leavers (i.e. those who have passed the *Abitur*—the broadly-based German certificate of secondary education). But this is not the case in the future of access to university, in effect, the right to study any chosen subject at any institution of higher education.

In 1972, a judgement of the Federal Constitutional Court confirmed that this right was guaranteed by the Basic Law of the German constitution, which states that the right of all Germans freely to choose their place of work and study is guaranteed. But the

Court could not avoid facing realities: the number of *Abiturienten* (and therefore students, given the then very high transfer rate) had risen far beyond even the most optimistic forecasts (from 291,000 in 1960 to 510,000 in 1979, to 562,000 in 1979) and was certain to increase further (as it, indeed, did, to 578,000 in 1979). Since the expansion of the institutions of higher education had not kept pace with this development, the overcrowding of many subjects was so serious that without limiting access, the imposition of a *numerus clausus* as a temporary measure, provided an institution's student capacities in every course were fully used and selection criteria were applied uniformly throughout the Federal Republic.

This decision of the Federal Constitutional Court marks an important stage in the positive development of German universities. It legitimised—however gingerly—selection after the *Abitur*. Of course, some sitting had been practised before, for example in the early post-war years when political as well as social criteria were applied. From the mid-1960s onwards the number of new entrants to some subjects, notably medicine and dentistry, were again limited. Then universities acted individually and on their own initiative. With the tacit agreement of the relevant Länder education ministers, but not with the approval of the Federal Government, a second important consequence of the judgement—the governments were obliged to step in and regulate the matter if the state was given the right and duty to legislate and to administer in an area which had been delegated to the private sector of universities under the umbrella of "academic freedom".

This resulted in a flood of most detailed and perfectionist national legislation: two inter-Länder Treaties in 1973 and 1978, the earlier one establishing a Central Admissions Office (ZVS); special clauses dealing with admissions in the 1978 *Hochschulreformgesetz* (General Framework Law for Institutions of Higher Education); and several, frequently amended regulations setting out in incredible detail procedures of allocating places to applicants and of determining the student capacity of an institution.

The latter, for example, does not only involve complicated mathematical calculations which have to be carried out twice a year in every institution for every course, in order to determine exactly the number of new students that can be admitted. As a prerequisite it also forced the ministers of education to lay down precisely and uniformly throughout the Federal Republic the minimum number of weekly teaching hours for each category of university staff, including full professors. The ministerial bureaucracies soon came to regard the extensive application of admission regulations as the answer to the entire problem of overcrowding; and many university departments were only too glad to have an official allocation limit their student intake. At the height of the *numerus clausus* wave, when the two courses in the subjects of medicine and dentistry were restricted, nationwide selection was carried out by the ZVS according to criteria which placed the main emphasis on means to achieve the achievement of all subject matter to be studied in the *Abitur*. But it also took into account the time an applicant waited for admission since he passed the *Abitur* and made some allowance for hardship and other special cases. The procedure and the application were challenged

by literally thousands of students in the courts including the Constitutional Court, and quite a few of them won their university place through a court ruling. As a result, the Länder had to modify the procedures and tighten them up, thus succeeding in making them even more complicated. Yet, however perfect, mathematics-based, and therefore supposedly objective, such a selection system could not eliminate the basically subjective element of individual teachers awarding their own marks to questions and answers, which in any case varied from Land to Land.

The whole problem became such a sensitive political issue that the Länder prime ministers themselves were forced to intervene: at the end of 1977 they promised a rapid further reduction in the number of subjects affected by the *numerus clausus*. The finance and education ministers worked out an emergency staff "overloading" programme to deal with the still mounting stream of potential entrants which will only peak in 1985.

Now two thirds of all subjects are without entrance restrictions. Access to others is only limited in a few institutions. In other subjects, for example, electrical engineering or law, *Abitur* grades are the only admissions in all, the ZVS merely distributes the available places; all applicants are guaranteed a place, although not necessarily at the institution of their first choice.

There are just eight subjects left where a general selection procedure operates, ranging from agriculture and architecture to pharmacy and psychology. There were 59,000 applicants this autumn for 39,000 places in these subjects. The original scheme is now modified to take account of regional variations in the *Abitur* averages, by introducing a *Land* quota for each subject.

In the three remaining subjects, medicine, dentistry and veterinary medicine, the number of applicants per place has been higher and, consequently, the competition for initially unsuccessful applicants longest (up to 10 years for medicine). The tests, which are designed to provide more subjective selection criteria, have been accepted after the end of the three-year experimental period up to 30 per cent of places will be awarded on the basis of *Abitur* averages. Test results and *Abitur* averages will still be reserved for subjects where the top average *Abitur* marks on the other hand, the quota for each subject will be allocated on the basis of a "weighted" average.

It is to be expected that the subjects currently within the general selection procedure will gradually be opened up. The fashionable subjects—medicine, dentistry and veterinary medicine—however, will remain restricted for the foreseeable future and the rest will eventually become standard procedure—not merely because there are so many applicants, but also because the governments will be happy to use this new, not previously available device for manpower planning in a crucial area: it will be used for the same reason as to keep the ZVS in existence as long as possible, whether the government like it or not: it enables the government to steer qualified grammar school leavers away from certain courses, and considering that the serious curriculum reform which might result in a more "vocational" specific career prospects, it is a long, slow process.

Some of their activities in fields outside higher education might need to be taken over by new, smaller organizations, the report said, but the councils themselves should be abolished.

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Christopher Price / Few threats

crimes against humanity.¹¹ Put another way, proceedings of the Nuremberg type are attractive to men of power only when the identity of victors and vanquished is conveniently settled in advance.

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BOOKS

The poet without flesh and blood

Tennyson: The Unquiet Heart
by Robert Bernard Martin
Clarendon Press: Oxford University
Press, £12.95
ISBN 0 19 812072 9

The Vision of the Night: a study of source, evolution and structure in Tennyson's Idylls of the King
by J. M. Gray
Edinburgh University Press, £10.00
ISBN 0 85224 382 0

by John Lucas

In 1837 Leigh Hunt wrote to Tennyson, asking him whether he would be willing to provide some account of his life. "I have no life to give," Tennyson replied, "for mine has been one of feelings, not of actions." Perhaps he resented the attempted intrusion on his privacy, perhaps his life was telling the truth. At all events, R. B. Martin plainly agrees with him. For here we have a massive biography, one that inches its way forward from an account of Tennyson's forebears all the way through to their burial service at Westminster Abbey, which Henry James found "a most curious and seemed to be too many masters of Balliol, too many Deans and too many Alfred Austins." It tells us all about the black blood of the Tennyson family, and in doing so uncovers those secrets the poet hoped would be buried with him.

During Tennyson's last years his older son Hallam became a virtual house prisoner at Farringford and Aldworth, catering for his ailing parents and, more importantly, being prepared for his life's work, that of writing his father's biography. According to Martin, for the best part of a decade Tennyson talked to his son about the project daily, and made clear what was to be said and what was not.

But it should not be assumed that the evasions of the father's biography of his father were all due to Tennyson himself; many of them came from Hallam and from his mother, who carefully tried to remove all traces of the rough Lincolnshire life of which his black blood, his inability to keep his ships cultivated, his reluctance to marry, his occasional obscenity and bad language, his terrible fits of depression, his obsessive fear of poverty, and his slowness to assume the responsibilities of maturity.

Charles Tennyson's biography went a long way towards repairing the omissions and evasions of Hallam's, and Martin completes the work. *The Unquiet Heart* gives us a catalogue of the ill-effects of fathers, and the mothers, and uncles, and brothers and sisters.

Tennyson's grandfather, "The Old Man of the Woods," with his desire to establish the family's name and fortune, his frugal, unpretentious and self-sufficient life, his love and allegiance, was undoubtedly an extraordinary figure. A cross between Lancelot and Sir Pitt Crawley. His preferred younger son, Charles, rejoiced in a quite absurd vanity—he took the name "Dynameus" as part of an attempt to persuade others of the family's lineage. And the older son, the poet's father, was very probably, certifiably, a little bit of a madman. He was a man on a closed stool, and finally he put a pipe-stem in his mouth by way of a pipe and appeared as a great bird on a branch. Not bad. And scattered throughout his biography are stories which make Tennyson more rather than less human. I particularly like the account of the poet as a grand old man taking a young girl out for a walk, the story of the poet's death in his long, flowing robe, his wide-brimmed hat, inevitably people stared. "Child," Tennyson said to her, "your mother should dress like you, and I should dress like her."

Oddly enough, it is possible to make a connection between the story and that of the poet's daughter who should have married a. H. Hallam, became increasingly eccentric as she grew older.



Julia Margaret Cameron's "Dirty Monk" photograph of Tennyson, taken from Andrew Wheatcroft's *The Tennyson Album* biography in original photographs (Routledge & Kegan Paul, £10.50).

In the mid-1840s, and which prompted Tennyson to seek rest in the quiet of his disorders in what were called water establishments, and Tennyson in particular seems to have been quite spectacularly dirty, although when he acquired Aldworth he at first bathed four or five times a day, and then he took to the bath and read about little birds. Both poets were compulsive talkers, and before his marriage Tennyson would frequently arrive at a friend's house unannounced and unexpected and sit up half the night talking, a habit which Martin says "could be disruptive... however necessary it might be for Tennyson."

As with Auden, so Tennyson's talk was frequently monologue, the sign of an anxious, lonely man, desperate for communication. His idea of the day stop talking in case the silence be too great. (Coleridge is another example of this phenomenon.) The talk would often prove fascinating. "Well, Alfred you do talk damn well," Thackeray said to him, and he told Adelaide, Frederick, and Tennyson's conversation "is often delightful. I think, full of breadth, manliness and humour: he reads all sorts of things, swallows them and digests them like a great poetical bee-constructor. Such matters do help to humanise him."

One might even try to see Tennyson as like Auden in his sexual preferences. But this will not do. Martin is surely right to deny that Tennyson's love for Hallam was homosexual. "On the other hand, there is no denying the intensity embodied all the gladness of Tennyson's life, and its loss—which would inevitably have come about even if Hallam had not died—in a word, the cause of much of the despondency which characterizes the later Tennyson. He never recovered from the loss of his youth. And here we come to the real difficulty of writing about Tennyson. Auden remarked that there was little that Tennyson did not know about melancholia, and that there was little else that he did know. And when Edmund Gosse came to write an appreciation for Tennyson's eightieth birthday he noted that "in mere intellectual capacity of attainment it is probable that there are many who excel him."

He has never pointed the way to undiscovered regions of thought. "Where then has his greatness lain? He has written, on the whole, with more constant, unwearying and unvarying excellence than any of his contemporaries. This is his greatness. The truth is how even this 'The Unquiet Heart' cannot avoid revealing a man who, of all the wending which Thackeray mentions? How did it find expression in the poetry? The answer has surely to be: hardly at all. Nor is that the end of the matter. Leave aside the famous quote about 'the single groove in the brain' and the fact remains that Tennyson's poetry is almost unthinkingly empty of any understanding of or interest in his age. For although Martin says that Tennyson was interested in reading about science—and the library confirms this—now housed at Eton, he is asking himself whether the science of the day was of any use to him. He would go provided that certain conditions were met, among

them that there should be no mention of Irish distress. And he was in 1848.

Tennyson's ignorance of politics of what was going on in England explains why neither *Maud* nor *The Idylls of the King* will do. Coleridge disliked *Maud* because of its morbidity and "its faith in the unique social regeneration" of a man who has lived in books... and from the same cause I suppose he brings everything back to himself."

The point is that Tennyson is interested in very little beyond himself. "Tennyson, we cannot live in art," Trench's well-known rebuke has been taken to be irrelevant or unfair, yet I do not think it so easily dismissed. Nearly all of Tennyson's poetry is marked by astonishing technical mastery (it is one of the oddities of literary history that Coleridge thought his metres unsound); but in the last resort he seems to have seen and cared about too little. A girl who had met him once, and briefly, remembered that with his eye-glasses he "looked you thro' and thro' and made you feel that he was taking stock of you from head to toe." The truth is, of course, that Tennyson was very short-sighted, and this fact has an almost symbolic significance. I do not think that he was very greatly interested in other people, least not after Hallam's death. He was a cold fish, selfish in money matters and in nearly all his personal relationships. Even Martin, who is clearly sympathetic to the poet, admits that by the mid-1850s the belief that he was a poor man, which Tennyson had been fostering for so many years, was beginning to take on a slightly selfish quality that some of his friends and relatives resented.

More important is his attitude to Emily Sellwood, whom he eventually married, but only after years of making her desperately unhappy. (The fact of that unhappiness is plain to see, both in Walter's portrait of her, painted in 1862, and in the photograph taken a year later which Martin reproduces.) And what are we to make of his staggeringly brutal insensitivity to more child with the rich poet building out the price of 10 guineas for Lear's watercolours, and complaining at the cost of having them framed? No wonder that Lear should remark that judging from Tennyson's talk and what I think of more child and a foolish one too, were it not for his sharpness in financial matters. The self-centredness goes deep. Martin reports that when Lear told him about the death of a child from infected teeth, Tennyson thought only of himself, and nearly died of tooth: I was given over, and lay for a long time—etc, etc, etc. He behaved inconceivably to Fitzgerald, one of the kindest and most lovable of men (Lear told him his wonderful late poem to him, perhaps making a mistake and he wouldn't go to James Spedding's funeral in 1881, although Spedding had remained on close terms with him since their days as Apostles).

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Calvinism to capitalism

Presbyteries and Profits: Calvinism and the development of capitalism in Scotland, 1560-1707
by Gordon Marshall
Clarendon Press: Oxford University
Press, £18.00
ISBN 0 19 827246 4

Scottish Capitalism: class, state and nation from before the Union to the present
edited by Tony Dickson
Lawrence & Wishart, £9.50
ISBN 0 85315 482 1

Potentially these books have much affinity with each other. *Presbyteries and Profits* is an attempt to use Scottish evidence to test Weber's thesis of the contribution of protestantism or more precisely of Calvinism, to the spirit of capitalism. *Scottish Capitalism* is a comprehensive survey of the economic history of Scotland from the 16th to the present. The affinity remains in substance. It is hard to imagine two books so far apart in so many ways.

Weber's thesis shows such resilience under attack that it is easy to think it must not be so lacking in merit as its critics suggest, but one fault, in Weber as well as in much of the criticism, is that it is not accompanied by convincing substantive evidence. Scotland was wrongly influenced by reformed theology and so provides Dr Marshall with a useful test case. He has carefully investigated the nature of Calvinist ethic and the spirit of its capitalism from confessional standards and obscure, and sometimes obscure, writing on pastoral theology on the one hand and from the primary sources of business history on the other. He emerges as a supporter of Weber and suggests not merely a coincidence of Calvinist ethics, driving its devotees to the good works which were the fruit of their election, and of the

expansionist economics of the capitalist spirit, but a causal connexion between them, though he only skirts around the question of great interest to economic historians of precisely how important that link was in determining the rate of economic growth.

Dr Marshall's work is therefore both a detailed, scholarly monograph on Scottish experience and a study of wider implications for any historian or sociologist interested in Weber's thesis. Even those who remain sceptical of Dr Marshall's conclusions will admire the way he has culled his evidence and the clarity with which he presents it.

As a study of one aspect of the growth of capitalism, it might have been expected that Dr Marshall's study would have fitted well into the wider objective of the other book, but that is far from being the case. Seven authors have contributed to *Scottish Capitalism*. The chapters range widely, not only in time but in substance. It provides a stridently Marxist interpretation of Scottish history, setting out "to establish the part capitalism played in Scotland's integration into the British state—whether the relationship was client or colonial, one of participation or of subjection to British imperialism." Even those uninitiated into the jargon of the social sciences will read Dr Marshall with pleasure and without confusion for he is able to deal with theoretical issues in economics, history, sociology and even the history of literature. It does not greatly advance the study of Scottish history, and why, if there is to be a fruitful partnership between sociologists and historians, it will be by following the approach and methods of Dr Marshall.

R. H. Campbell

R. H. Campbell is professor of economic history at the University of Sterling.

What More did all day

The Public Career of Sir Thomas More
by J. A. Guy
Harvester Wheatsheaf, £20.00
ISBN 0 85527 963 X

A child confronting a rhinoceros at the zoo was heard to ask: "But what does he do all day?" Biographers of Sir Thomas More have been deficient in this respect. Of a comparable curiosity by the plus legend invented by "son Roger" that the king's good servant served with a certain reluctance, his affections staying upon some other heavenly things: his family, his God, his letters.

In so far as the biographical tradition has concerned itself with More's public career, it has presented a cardboard cut-out of integrity and conscientiousness. In a series of robustly iconoclastic investigations, Professor Geoffrey Elton, to whom this book is dedicated, has demonstrated that More, like other successful lawyers, actively sought office and its due reward: that the fears expressed by Rhyolodians in "The Dialogue of Consue" were amply justified by his relative importance as "Henry VIII's 'tame humanist'; and that as Lord Chancellor More was a far more passive participant in the events which led to his extinction. Now, Dr Guy, to whom we are already indebted for a fine study of the achievement in Star Chamber of More's predecessor, Cardinal Wolsey, has conducted a thorough investigation of what the Man for All Seasons did all day and every night of his life. In the author's own words, "this book is not merely a new look at More, but a new look at the man himself."

Dr Guy's authority rests principally on his acquaintance with the Chancery and the Star Chamber during the 16 months of More's tenure of the Great Seal, when 1565 new suits were initiated in Chancery alone. This mountain of research, painstakingly culled from the archives of the Chancery and the Star Chamber, is a very good one. There is a comparison with it.

John Lucas is professor of English at Loughborough University.



G. R. Elton's investigations having revealed More from representation as a cardboard cut-out of integrity and conscientiousness, Dr Guy tells us that the inspiration of the first of these factions was More and he boldly calls it 'More's party'. There is little enough evidence for this, and indeed, little enough about More in Dr Guy's later chapters. The Lord Chancellor's active participation in the frustration of "the king's great matter" involved profound contradictions and required unusual circumspection. Any scholar who knows that the equity of substance could be proved at the trial. But two years later, Sir George Throckmorton implicated More in the encouragement of parliamentary opposition to the king's, or more precisely Cromwell's, agrarian reform. Dr Guy tells the rest of Throckmorton's important confession in an appendix.

He also draws attention to the political implications of More's relentless pursuit of heresy and heretics. The files of Star Chamber reveal the Lord Chancellor's inordinate and quite irrelevant interest in whether the clergy, dying in the town ditch of Norwich as a heretic or as a true Christian. The answer to such questions could swing the political weathercock and either send off or pacify the storm, in which, following the Subsidy of the Clergy, More's public career abruptly terminated.

Patrick Collinson

Patrick Collinson is professor of history at the University of Kent.

Royalist petitions

Prelude to Civil War 1642: Mr Justice Malet and the 'Kentish Petitions'
by T. P. S. Woods
Michael Russell, £8.95
ISBN 0 85955 070 2

A characteristic feature of the political struggles of the spring of 1642 was the war of petitions between the radical supporters of John Pym and the moderate royalists who strove to repair the tarnished image of monarchy against the coming struggle for the soul of the parliamentary centre.

The first of the Kentish petitions which are the subject of this book is the best known of a number of moderate conservative petitions designed as counter-strokes to the petitions organized by Pym's supporters in the provinces. And just as Pym and his London allies encouraged the practice of what his enemies described as "unumutary petitioning", so did his Kentish opponents seek to back their petition with an impressive show of support, which could all too easily turn nasty if their desires were frustrated. The petition is one of the earliest of a number of clear indications of widespread suspicions in the country about what moderate men regarded as Pym's extremist policies, though it is not perhaps quite so decisive a prelude to civil war as another Kentish petition six years later was to be to the Second Civil War.

The Kentish petition had first seen light of day at the Lent assizes at Maidstone, presided over by Mr Justice Malet. The petitioners, among whom was Sir Edward Dering, the erstwhile proposer of the Root and Branch Bill but now moving rapidly rightwards, were to learn that freedom to petition extended

no farther than to those who petitioned for things approved by Pym. Their arrest had the effect of putting protest in the county into the hands of extremists, a development which probably suited Pym's book very well. Malet himself was now the object of suspicion, and his imprisonment, which was to be brilliantly exploited by the great royalist historian Clarendon in his denunciation of parliamentary illegality, followed what were regarded by Pym and his allies as seditious sentiments uttered from the bench when again on circuit in the summer. He was not freed until the end of 1644, when he was exchanged for a parliamentarian in royalist hands.

This book was written not by a professional historian but by an amateur, a businessman who lived in and loved Malet's Dorset house, and is an occasion of sadness that he did not live to see his work published. The main outline of the story which he here produces in greater detail has long been familiar to students of the period through Alan Everitt's pioneering study of the Kent in the Civil War and Interregnum. Professional historians might cavil at his clear royalist bias; at his oversimplified dichotomy of King-versus-Parliament to characterize the events of the early part of 1642; at his occasional factual errors such as the statement that Charles I surrendered to the parliamentary army (rather than to the Scots) at Newark. But many of them might see with profit to emulate his historical imagination and his crisp, elegant style of narration which make his well-told and important story compulsive reading.

Robert Ashton

Robert Ashton is professor of English history at the University of East Anglia.

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BOOKS

The private life of Robert Oppenheimer

Robert Oppenheimer: letters and recollections
edited by A. K. Smith and C. Weiner
Harvard University Press, £12.00
ISBN 0 674 528 33 6

In the autumn of 1922, the young Robert Oppenheimer came as a freshman to Harvard to study chemistry. His later career, as a student in Europe and as a teacher in California, was remarkable because of the effect Oppenheimer had on the growth of theoretical physics in the United States. But what singled out Oppenheimer from his peers was his role as Director of the Los Alamos Laboratory where the first atomic bombs were designed and built.

This book of letters and recollections of Robert Oppenheimer brings together the bulk of his surviving pre-war correspondence and a selection of the letters he wrote during the war. The book's editors, though, are more than that; they have added a mass of detail which they have culled from interviews with Oppenheimer and his contemporaries. Their commentary increases the usefulness of the letters manifold, the result being a very full and informative book which clears the way for a comprehensive biography.

Robert Oppenheimer was born in 1904 into a prosperous family of German extraction living in New York. His education at the Ethical Culture School was broad and stimulating and during his school days he showed a keen interest in meteorology. He was friendly with a young teacher of English at his school, Herbert W. Smith, and most of the early letters in this collection were written to him. Their friendship was cemented when Smith accompanied Oppenheimer on a trip to New Mexico in 1921 in a year between school and university which Oppenheimer spent recovering from trench dysentery he had caught on a European trip. Later, Robert Oppenheimer was to return to New Mexico with his brother, Frank, to stay at the ranch not far from the future site of the laboratory at Los Alamos.

The early letters to Smith were written soon after Oppenheimer had arrived at Harvard. Many of them are elaborate, beginning with "long-winded, tapestried apologies". Often Oppenheimer refers to letters and short stories written for his own pleasure and sometimes sent to his correspondents. Unfortunately, none of

this material seems to have survived.

Oppenheimer was at Harvard for three years, one fewer than was normally required, but still he managed to listen to lectures on a wide range of subjects outside his degree course. After graduating in chemistry and armed with the recommendation of Percy Bridgman, Oppenheimer applied to work under Rutherford at the Cavendish Laboratory in Cambridge. Rutherford could not take him and Oppenheimer came to the Cavendish as a student of J. J. Thomson.

The year he spent in England was rather a trial for Oppenheimer, partly because he suffered from depression, but he did meet a number of physicists who were developing the new theories of quantum mechanics. Oppenheimer decided his future lay with theoretical physics and he accepted an invitation from Max Born to work in Göttingen. Oppenheimer evidently enjoyed his stay in Germany and his circle of correspondents grew to reflect his new interests. Now his letters were usually concerned with applications of the quantum mechanics he was mastering, technical problems which provide a strong contrast to the advice about women offered to his 16-year-old brother, Frank.

In the spring of 1927, Oppenheimer completed his Ph.D. in Göttingen with a thesis on the theory of continuous spectra. Soon afterwards he returned to the United States and there he arranged to work for both the University of California and for the California Institute of Technology. However, meteorology had become a friendly with a young teacher of English at his school, Herbert W. Smith, and most of the early letters in this collection were written to him. Their friendship was cemented when Smith accompanied Oppenheimer on a trip to New Mexico in 1921 in a year between school and university which Oppenheimer spent recovering from trench dysentery he had caught on a European trip.

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J. Robert Oppenheimer in 1926 or 1927

lowed his annual migration to Pasadena. The letters written by Oppenheimer in this period do convey the excitement of the time and give some insights, but no more than that, into the growth of the physics department at Berkeley.

A noticeable gap in the record left by the letters concerns Oppenheimer's political interests in the late 1930s. It was his radical interests and the people he met because of them that provided some of the evidence against him which led the Atomic Energy Commission to withdraw his security clearance in 1954. Oppenheimer explained at the Commission's hearings that his interest in politics began around 1936, partly because of the treatment of Jews in Germany but also because of the effect of the Depression on his studies, who had found it difficult to find work.

The late 1930s were interesting, too, for physicists. The discovery of the meson (now muon) stimulated Oppenheimer's interest in cosmic rays. But the discovery that was more significant was that of uranium fission made by Hahn and others late in 1938. A few days after learning about fission, Oppenheimer excitedly wrote to George Uhlenbeck claiming that "a ten cent cube of uranium deuteride might very well blow itself to hell".

For various reasons, in the United States progress in designing

a fission bomb was slow in the next year or two. Oppenheimer was not directly involved in the work. But after the United States entered the war, the work was more urgent and Oppenheimer became responsible for a small group working on the theory of the atomic bomb. Late in 1942 General Leslie R. Groves took charge of the Manhattan Engineer District, as the bomb project was called. Some of his first decisions were to centralize the work on bomb design in a new laboratory, headed by Oppenheimer. The laboratory would be sited at Los Alamos in New Mexico, an area Oppenheimer knew well.

The letters from the Los Alamos years testify to the varied work that Oppenheimer had to organize at the laboratory as well as to the qualities that made him successful as its director. Many letters refer to problems of physics but others reveal the details that had to be sorted out before a motley collection of civilians and military personnel would work well together. Salaries had to be fixed and bathrooms allocated. The atmosphere at Los Alamos comes across strongly from the editorial commentary and must owe much to Alice Kimball Smith's own stay there.

In late July and early August 1945, one bomb was tested in New Mexico and two others used on Hiroshima and Nagasaki. With the technical success of the laboratory demonstrated to the world and the pressures of war gone, the doubts that had been submerged in the frantic rush to build the bomb now came to the surface. Oppenheimer was well placed to appreciate the problems. On the one hand he shared the concerns of the scientists who were worried about the way the weapon they had created had been used or might be used in the future. But Oppenheimer also served on a committee to advise the Secretary of War about post-war atomic matters and knew the views of the people who would make government policy. The conflicts between these different interests came across strongly from one of the last pieces of the book, a speech made by Oppenheimer in November 1945 to the Association of Los Alamos Scientists soon after he had resigned as director of the laboratory. He had come a long way from the shy undergraduate with an interest in crystals.

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Plasma physics

Fundamentals of Plasma Physics
by V. E. Pavlenko, A. P. Zhilinskii and I. E. Sakharov
Wiley, £22.10
ISBN 0 471 04593 4

There seem to be two basic approaches to the pedagogical presentation of plasma physics: in my experience the more common method is to start with individual particles and their motions in external fields, develop the idea of the motion of an ensemble of non-interacting particles, and finally introduce inter-particle collisions as a perturbation. This book very firmly takes the opposite course: a plasma is initially considered as a gas of strongly interacting particles with collisions the dominant influence on the motion, while external electric and magnetic fields are introduced later as more or less as perturbations. Not until two-thirds of the way through the book do we encounter a discussion of the motion of isolated particles in magnetic fields. Thus the book is of more direct interest to those working with gas discharges and similarly weakly ionized plasmas than to those in the fusion field. Nevertheless, it is easy to forget that virtually all plasmas have their origin in some kind of gas discharge, and the approach of this book is a considerable value as a corrective to the usual one.

The approach is almost exclusively theoretical (rather characteristically, the only experimental results quoted in the whole book are measurements of scattering cross-section of electrons in helium and some other gases), and the development is careful and precise; the intuitive approach has no place here. This precision extends to the title: whereas in many cases it has the feeling that words in such a title are "filler" or "padding", here they are simply necessary. The book is a very good example of a book that is not a book for the physicist, but a book for the physicist who wishes for his own intellectual satisfaction to see his development laid out clearly and logically.

The title *Fundamentals*... is also apt in that the book does not set out to be a comprehensive text on plasma physics. While propagating the plasma physics, it is largely concerned with the theory of anomalous plasma diffusion due to drift instability. Plasma stability theory is represented only by this and one or two other examples. Actual plasma experiments are not discussed, and indeed one would not suppose from this book that the development of a subject has owed anything to experiment at all.

But the book should be judged for what it is—a development of the theory of plasma from first principles as far as the knowledge of collision dominated plasmas with and without a magnetic field. The completeness of its coverage of these topics is remarkable and commendable. As a result, the book is a very good example of a book that is not a book for the physicist, but a book for the physicist who wishes for his own intellectual satisfaction to see his development laid out clearly and logically.

The presentation is informal, but not sloppy, with full explanations. Unfortunately, theorems are presented in ordinary type which makes it hard to distinguish them from the main text. As analytical approximations are required ultimately, even in exact methods, some comments on such techniques would have been useful. There are a few exercises, but solutions to all of them are given. As a parting shot, let me observe that symbolic computation systems have reached a level of sophistication where they can be valuable in the study of partial differential equations, a fact that may be reflected in the next generation of textbooks in this area.

J. S. N. Elvey is a research mathematician in the Mathematics Department of the University of London.

M. G. Ruskov is professor of physics at the University of Manchester.

Notions of computation

Computability: an introduction to recursive function theory
by R. J. Cutland
Cambridge University Press, £20.00
and £6.75
ISBN 0 521 22364 9 and 29465 7

Recursive function theory—or as it is more generally known today, "recursion theory"—is the mathematical theory of those operations which we conceive as being performed in principle by machines which compute in a deterministic "step-by-step" fashion. Thus the general setting for the theory of "computability" is an ideal world from which practical physical limitations—for example, on the time taken and storage space used in the course of a computation—have been removed.

Stemming from the early pioneering work of Gödel, Kleene, Post, Turing and others in the 1930s, recursion theory has developed into a rich and challenging branch of pure mathematics. Through its analysis of the fundamental notion of "computation" and the sophisticated techniques which have subsequently evolved from that analysis, the theory has fed into the philosophy and foundations of mathematics, computer science, and those areas of algebra and analysis where questions of "decidability" and "constructivity" naturally arise.

The subject fully merits some place in today's undergraduate mathematics (and computer science) curriculum, possessing as it does a high degree of relevance, a wide range of applicability, and at the same time a distinctive mathematical flavour all of its own. However, there has until now been a lack of any really suitable textbook for such a course—that is, a book written specifically for the second-year or final-year undergraduate, giving a detailed, yet accessible, account of the general theory and pointing out its applications and the directions

of present-day research. Dr Cutland's book, based on his lectures at Hull University, fills this gap admirably and promises to become a standard and widely used text.

The book falls quite naturally into two parts. Chapters one to five cover the basic theory of computability (partial recursive functions as far as the Gödel-numbering of programs and machine subsets, and the resulting normal form theorem. Chapter six discusses some immediate applications: to questions of decidability; thus, the undecidability of the halting problem (that is, whether or not a program, operating on a given input, will ever stop) is dealt with in some detail and generally the undecidability of validity in the predicate calculus is treated neatly in terms of the author's chosen model of a computer. Sturm's algorithm is used to compute the number of zeros of a polynomial over the rationals, and the undecidability of the "word problem" for groups and Matijasevič's 1970 solution of Hilbert's tenth problem are both mentioned briefly.

These early chapters provide plentiful material for an introductory course on computability, there being no prerequisites other than a basic mathematical maturity which ought to be gained by the second-year student. An attractive feature of this part of the subject is that it is clearly motivated by a single fundamental question: "How successfully can we capture, in terms of a precise mathematical definition, our intuitive concept of a computable function?" Dr Cutland bases his approach on what, in my experience, is by far the simplest and most easily understood model of computing—that is, the Shepherdson-Sturgis idea of an unlimited register machine (URM).

The main closure properties of the URM-computable functions are developed carefully in chapter two, with many useful examples and exercises illustrating the breadth of the notion. Chapter three sketches out the equivalence of URM-computability with various

other well-known approaches before collecting together the evidence supporting Church's thesis—that our intuitive idea of computability coincides exactly with the precise concept of URM-computability.

The second half of the book consists of six chapters developing more advanced topics, a selection of which would form a good final-year undergraduate or first-year graduate level course on recursion theory. The items covered here are recursively enumerable sets, their application to Gödel's incompleteness theorem, many-one reducibility and relative recursiveness, effective operators, Kleene's first and second recursion theorems and their respective applications to the semantics of programming languages and the many-one equivalence of creative sets, and finally the complexity of computations, a topic which, despite its technical difficulty, students seem to find particularly stimulating.

There are one or two points at which the treatment falls a little short. In particular the section on Turing degrees could most usefully have been expanded to include a discussion of the arithmetical hierarchy, its characterization in terms of the jump operator, and also one or two basic degree constructions which, after all, are the "bread and butter" of modern recursion theory. However, this is a relatively minor criticism of a book expressly designed as a stepping-stone to more advanced work. (The final chapter does give some useful references and suggestions for further study.)

Dr Cutland has produced here an excellent and much-needed textbook which will undoubtedly help to establish recursion theory as a more widely taught branch of mainstream mathematics.

S. S. Wainer is lecturer in pure mathematics at the University of Leeds.

Applicable probability theory

Probability Models and Applications
by Ingram Olkin, Leon J. Glesser and Cyrus Derman
Cambridge University Press, £13.50
ISBN 0 521 28923 7

Until about the middle of the present century the professional statistician was a rare bird, and the professional probabilist even rarer. Wartime conditions, however, called for statistical techniques in the control of uniformity of mass-produced manufactured components, the assessment of military tactics, and other fields. Mathematicians and scientists produced the necessary methodology and transformed themselves into practitioners of a new art. Statistics and operational research emerged as respectable academic disciplines, and a stream of textbooks on probability and statistics started to flow.

This stream has by now differentiated itself into several well-defined channels. Leaving aside the expository of statistical inference, which exploits but does not expound probability theory, the main source of information about our subject is the large number of mathematically sophisticated texts with titles like *Mathematical Statistics* or *An Introduction to Probability and Statistics*.

With a few outstanding exceptions, like the magisterial and authoritative *Kendall and Stuart*, this category consists of a multiplicity of undistinguished, under-graduate level texts. Under the aegis of the American origin, the theory is developed only to the extent required by the statistical applications. The emphasis is on random variables and their distributions, with accounts of the standard distributions, and the theory of stochastic processes is barely touched. The book is a good example of a book that is not a book for the physicist, but a book for the physicist who wishes for his own intellectual satisfaction to see his development laid out clearly and logically.

M. G. Ruskov is professor of physics at the University of Manchester.

of stochastic convergence and the central limit theorem.

Probability theory is, however, more than a rationale that underlies statistical tests, and more, too, a branch of the mathematical theory of measure and integration. It is a branch of pure and applied mathematics with a strong intuitive nexus between the word and the world. Its most vigorous contemporary manifestation is in the theory of stochastic processes, which attempts to describe dynamic (and/or time-dependent) systems (such as queues, reservoirs, epidemics, rainstorms) that are influenced by interacting spatio-temporal random fluctuations. Successful though classical probability theory has been in exploiting the simple theory of independent events, there is a limit beyond which non-independence cannot be ignored, and it is in the modelling of particular problems of interdependence that the characteristic flavour of stochastic processes lies.

In principle the probability that the world will have a particular configuration tomorrow depends on the whole of its history, but in practice the effects of the remote past can often be neglected. Markov's innovation was to formalize this by introducing the idea that in evaluating the conditional probability the system's entire history, since it need take account of only a finite and short segment of that history, "Markovian" systems are those in which this concept holds with strict accuracy. In the most important version of this, the finite segment referred to above becomes the most recent single datum in the historical record. The picture of interdependence to which this gives rise combines with realism as a model for many phenomena. It dominates the theory of stochastic processes as it has so far developed.

All adequate understanding of Markov chains does not require sophisticated mathematics, and the virtual exclusion of the topic from most of the widely used undergraduate "probability and statistics" texts is merely a regrettable convention. Excellent expositions exist in more advanced or specialized works, but only a small number of the undergraduate textbooks in common use give anything like an adequate coverage: there is the admirable Feller (Vol 1), of course, but not much else.

For its virtues in this respect the book under review is to be welcomed. It gives an excellent account of applicable probability theory in the context of college-level mathematics, covering the basic concepts of probability theory, and random variables and their distributions, but also a useful catalogue of distributions goes beyond the rather restricted list favoured by the "Beyl" and the "Weibull" and the "Dirichlet" distributions. The book is well provided with examples, exercises, applications and diagrams, and has a superior collection of tables, including the Binomial (n,p) distribution for n = 1(1)10 and p = 0.01(0.05)0.50, selected values of the negative binomial, and values of the incomplete gamma function, as well as the usual Normal and exponential tables.

This book represents a move that is very much in the right direction. Perhaps it does not go quite far enough in these directions, but it is enough to justify the expectations aroused by the word "models" that is part of its title, and not as far as a stochastic differential calculus that would enable undergraduates to manipulate derivatives and integrals of random variables, but a good book none the less.

E. H. Lloyd

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Oxford University Press

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W.E. Williams

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Partial Differential Equations
by W. E. Williams
Clarendon Press, Oxford University Press, £15.00 and £7.50
ISBN 0 19 859 632 4 and 633 2

This book is intended to provide a fairly detailed introduction to partial differential equations for final-year undergraduate and first-year postgraduate mathematics students. The treatment is entirely theoretical, by numerical calculation, and no sharp bounds on solutions are derived. The introduction includes a sketch of variational formulations of partial differential equations, and of the construction, by superposition of special Fourier series, of solutions satisfying common boundary conditions. The question of well-posedness is raised only in passing, which is unfortunate, as many basic mathematical procedures lead to ill-posed equations, and suitable generalizations of the solution can be given (see, for example, *Mathematical Analysis* (1978) and *Mathematical Analysis* (1977)).

The next two chapters treat, respectively, first-order (nonlinear, and second-order, linear, equations. Among the non-standard topics covered are quasi-linear equations and weak solutions. The canonical classification of second-order equations is followed by a discussion of boundary conditions for the Laplace and wave equations, and also included are Chapters four, five is accomplished most successfully, especially for problems involving characteristics).

No use is made either of Riemann's method, or of generalized functions, beyond formal use of the delta function in the discussion of Green's functions, which, along with weak solutions (for example, the discontinuous functions separated by shocks), non-characteristic curves across which discontinuities are allowed, and the use of the delta function in the theory of

hardly required, so that, for example, integral operator methods are not mentioned, and no sharp bounds on solutions are derived. The introduction includes a sketch of variational formulations of partial differential equations, and of the construction, by superposition of special Fourier series, of solutions satisfying common boundary conditions. The question of well-posedness is raised only in passing, which is unfortunate, as many basic mathematical procedures lead to ill-posed equations, and suitable generalizations of the solution can be given (see, for example, *Mathematical Analysis* (1978) and *Mathematical Analysis* (1977)).

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E + A. w. Various conditions are given for the eigenvalues of E to be positive; and, it is shown that eigenfunctions for distinct eigenvalues are orthogonal with weight function w. Green's functions are introduced, as "singular solutions of Laplace's equation" (and determined in comparatively simple cases) and some of their properties are discussed. Finally, brief remarks are made on weak solutions. For hyperbolic equations, an extension of the Cauchy-Kovalevsky result is proved and other types of boundary data are also considered. Both Riemann's method and the (equivalent) extension to hyperbolic operators of Green's functions, are described (for the wave equation), with examples; and there is, again, a brief discussion of weak solutions (for non-self-adjoint operators).

The treatment of parabolic operators concentrates on the heat equation, with only a few comments on parabolic and uniqueness problems, and extensions to more general operators. In chapter seven, the analytical techniques customarily lumped together as "Fourier's method" are considered using separation of variables. It would have been useful to refer to general conditions for separability (for example, in the books of Morse and Feshbach (1953), and Miller (1977), in which the Lie-group approach is used). This material is standard, but well presented, with examples.

Chapter eight is devoted to extending the theory of separation of variables, in more than two independent variables, the regular steady-state

joined—with due attention to differences as well as similarities. After this, comes a concise account of systems of partial differential equations in 'n' variables, including their possible reduction to single, higher-order equations, with some emphasis on quasi-linear hyperbolic systems, which have applications in gas dynamics and in the study of water waves. Finally, in chapter 11, the briefest sketch is given of some numerical approximation techniques, including the methods of: finite differences, characteristics, finite elements, and boundary elements (using associated integral equations). Adequate references are given.

The presentation is informal, but not sloppy, with full explanations. Unfortunately, theorems are presented in ordinary type which makes it hard to distinguish them from the main text. As analytical approximations are required ultimately, even in exact methods, some comments on such techniques would have been useful. There are a few exercises, but solutions to all of them are given. As a parting shot, let me observe that symbolic computation systems have reached a level of sophistication where they can be valuable in the study of partial differential equations, a fact that may be reflected in the next generation of textbooks in this area.

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BOOKS

Blind quest for simplicity in nature

From Atoms to Quarks: an introduction to the strange world of particle physics by James S. Trell. Athlone Press, £7.50. ISBN 0 485 11204 3.

"Quark" is a word that has entered the vocabulary of science fiction writers along with other whimsical terms beloved by the fanciful physicists, like "gluons", "charm" and "strangeness". The very names create an interest among the public who want to find out the facts behind the fiction and understand what all the excitement is about.

For excitement there is. The huge accelerators of subatomic particles are now able to create conditions in a very small region of space that may mimic effects prevalent soon after the big bang. As the power of the accelerators has increased over the years to have we effectively probed back to the beginnings of time. During the past decade, in particular, the theoretical concepts invented by the mathematicians have been remarkably successful in anticipating and interpreting the experimental discoveries. This alone provides encouragement. What is more exciting is that the latest theories exhibit a certain mathematical elegance and, moreover, seem to be converging with ideas developed in the field of cosmology—the

study of the large scale universe which, up to now, has seemed far removed from that of the subnuclear physicists.

If the current trends of thought are correct then we have discovered that nature once exhibited an elegance and simplicity in the turmoil of the big bang. As the universe cooled so the initial symmetry of the natural laws became obscured as the quarks and gluons clustered to form protons and neutrons and, later, atoms. After the first three minutes the universe contained the basic ingredients that we see around us today.

This story has been well described by several excellent books on cosmology, the most successful of which was probably Weinberg's *First Three Minutes* (Deutsch, 1977), written before the most recent advances. Furthermore there has been a sad lack of popular books describing the discoveries in particle physics that have generated this new horizon. Thus it was with great hope that I began to read *From Atoms to Quarks*, a book which sets out to introduce the public to the strange world of particle physics. Sadly I was disappointed in the end.

The book starts well enough, the early chapters outlining the early quest for simplicity in nature, the discoveries of atoms, nuclei and the few particles that build up those

nuclei. This era in modern physics is well documented already in the literature and many readers of this book will already be aware of the confusion generated after the war as many siblings of the proton and other subatomic particles began to be discovered. Dr Trell takes us through this period and describes in great detail how various patterns were discerned among the ever increasing proliferation of particles. During the past 15 years it has become increasingly clear that these particles are clusters of a few more fundamental entities called "quarks".

No one has ever produced a free quark in the laboratory. However, particle physicists assure the public that quarks can exist inside particles like the proton, and that there is some principle of nature that prevents them being seen outside the proton. To many this is reminiscent of the story of the king whose (non-existent) clothes were claimed to be visible only to the enlightened few. This book devotes four chapters to this era: the discoveries that led up to the quark model, the search for quarks and the evidence for them summarized in a nice quotation from Eric Stanley Gardner's cartoon, the lawyer Perry Mason: "Circumstantial evidence is the best evidence there is... you just have to interpret it properly."

Sadly this portion of the book is marred by muddled descriptions (often misleading, sometimes plain wrong) and sloppy production; there are innumerable misprints and hand-drawn diagrams so badly prepared that they totally confuse. As examples I cite figure 71 which purports to show the eightfold way grouping of spin 3/2 baryons but is a hotch potch with the annotation seemingly garbled; figure 86 is incomplete, out of context and contains no explanation of the mysterious "14" in the left hand column.

One example of muddled description is on page 51 where he states that the force between two nucleons arises from their exchanging a virtual particle. This much is fine, but by continuing with the remark that each nucleon is attracted to the virtual particle during its transit and that this is why the nucleons are mutually attracted seems to have brought us back to the starting point. What attracts the nucleon to the virtual particle? And it is also worth pondering on the first paragraph on page 14, or the apples and oranges "explanation".

There seems to be general agreement that times are hard, and are liable to get harder. A widely (though not universally) proposed course of action for Britain is the development of microelectronic technology, on the grounds that if we don't then our commercial rivals will be irreparable.

There are two sides to the development of microelectronics—designing and making the devices, and then putting them to work. Two kinds of experts are needed for these two aspects, who may be briefly categorized as physicists and engineers. The physicists all need to master the material contained in *The Elements of Solid-State Physics*, on their way to the deeper understanding derived from a study of more advanced texts (a useful reading list is included), and subsequent involvement in the development of new devices and processes. The engineers need a general appreciation of the operation of integrated circuits, but their main interest is in the design, programming and interfacing. For many of them the level reached in the book is about right.

Perhaps one might suggest that an index of Britain's future prospects could be the sales figures of physics books and papers. However, the book is not a best-seller, and its readers are students in their first

year of a degree course, or intending to achieve that status shortly. The level of presentation is suitable for this group of readers, as one of the main difficulties complained of by such students is the large number of new concepts met in a large subject, and the problem of seeing their interrelation. The authors provide an introduction and nomenclature explanation, while leaving mathematical analysis as a treat for later.

The text seems to be free from error, managing the classic experimental results which call for a quantum treatment. The main emphasis is towards semiconducting materials and devices, but crystal structure and magnetic properties are also covered. One simple improvement would be to make it clear that a technical term is used, it is explained. Readers will discover that coherent radiation, electron beam machining and ductility are important, but not what they actually are.

In some cases the authors have adopted a policy of directness, providing plausible though unsound arguments which are later replaced by something better. The degree to which this is a safe practice has to be left to a user's judgment.

There are a lot of diagrams, as is only right and proper. These are often laid out in a clear and useful way, using a different symbol from the text, or making the main point soundly, but leaving a subsidiary one in error when it could equally well have been right.

In common with many technical textbooks the lettering in the diagrams is not the same as that used in the text. This is a result of the way the diagrams and text are prepared for printing, but it is a match for the way the subject is presented, especially for those whose "mother-script" is not the western alphabet. This point is made by British authors and editors, who manage to make an effective team for producing textbooks.

This is a typical textbook with simple diagrams scattered throughout the text and six pages collected together. The impression is that only a little thought has been given to visual presentation. For example, there are six pages completely devoted to the lettering in the diagrams, which is not the same as that used in the text. This is a result of the way the diagrams and text are prepared for printing, but it is a match for the way the subject is presented, especially for those whose "mother-script" is not the western alphabet. This point is made by British authors and editors, who manage to make an effective team for producing textbooks.

In some cases the authors have adopted a policy of directness, providing plausible though unsound arguments which are later replaced by something better. The degree to which this is a safe practice has to be left to a user's judgment. There are a lot of diagrams, as is only right and proper. These are often laid out in a clear and useful way, using a different symbol from the text, or making the main point soundly, but leaving a subsidiary one in error when it could equally well have been right. In common with many technical

the Nobel Prize within two years. However, theoretical physicists had predicted that a variety of quarks and manifest itself through the existence of particles like the J/ψ . Indeed during the summer of 1974 there had been a great deal of activity in the theoretical community centred on this very topic, which was rightly regarded as the hottest thing around involving, as it did, both the new theory of the quark force and the ubiquitous quark model. The theorists had predicted that a whole family of particles like J/ψ should exist. Their discovery was a triumph for the quark model, something that is not brought out at all clearly in the book. Trell writes that the existence of the related particles was "quickly perceived by theoretical physicists" as if this was after the event. (He also writes that the J/ψ was discovered at CERN, Geneva.) Every graduate student (Dr Trell apart) knows that Weinberg did no such thing; a physicist for his version of the latter. Then monitor his blood pressure as you tell him that Ting is given special prominence in the discovery of the gluon. Finally the Dutchman, 't Hooft, widely regarded currently as the leading light of high energy physicists, and whose discoveries were seminal in generating the present excitement, is not mentioned at all. (It is his work and not simply the existence of W-bosons that show the weak interaction theory to be finite; contrast page 212.)

The experimental discovery that highlighted the past decade was that of the J/ψ meson by Richter (who is not the brother of the Richter of earthquake fame, contrary to the claim on page 176) and Ting (who did see this particle first). The circumstances leading up to its discovery are somewhat misrepresented. Trell correctly reports that Ting's group working at Brookhaven, New York, first observed the particle in the summer of 1974 and studied it through the early autumn. Richter's group were working independently at Stanford in California. Trell writes about them: "By 1972 this facility was in operation... When the experimental evidence started to accumulate... [a new particle] was seen... The Stanford group named their new particle ψ . The two groups learned of each other's work in the fall of 1974 when Ting paid a visit to Stanford." One might gain the impression here that Richter had been studying the particle over an extended period, possibly the two years since 1972, certainly it does not bring out the fact that his group first saw the particle on a Saturday night in November 1974 and announced it only two days later.

The impact on physicists was astounding, Richter and Ting sharing the Nobel Prize. This is a principal scientific officer at the Rutherford Laboratory, Didcot.

Frank Close is a principal scientific officer at the Rutherford Laboratory, Didcot.

Developing solid-state devices

The Elements of Solid-State Physics by M. N. Ridd and J. Wilson. Wiley, £14.50 (hbk), £5.95 (pbk). ISBN 0 471 277 50 9 and 48 5.

There seems to be general agreement that times are hard, and are liable to get harder. A widely (though not universally) proposed course of action for Britain is the development of microelectronic technology, on the grounds that if we don't then our commercial rivals will be irreparable.

There are two sides to the development of microelectronics—designing and making the devices, and then putting them to work. Two kinds of experts are needed for these two aspects, who may be briefly categorized as physicists and engineers. The physicists all need to master the material contained in *The Elements of Solid-State Physics*, on their way to the deeper understanding derived from a study of more advanced texts (a useful reading list is included), and subsequent involvement in the development of new devices and processes. The engineers need a general appreciation of the operation of integrated circuits, but their main interest is in the design, programming and interfacing. For many of them the level reached in the book is about right.

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BOOKS

Meteorological dynamics

An Introduction to Dynamic Meteorology, second edition by J. H. Holton. Academic Press, £12.80. ISBN 0 12 354360 6.

Meteorology was until quite recently accurately summed up in the scriptural text "the wind blows where it wills, you hear the sound of it but you do not know where it comes from or where it is going". In the past few decades, however, the meteorological system has become observable for us to trace the origins of a given air current. The challenge of predicting its subsequent destination presupposes a sound understanding of how weather systems evolve. Unfortunately, the complex and all-embracing nature of the necessary simplifying approximations are unlikely to be guessed at until we know what we are studying.

This theory has grown rapidly with advances in the observational network and textbooks on dynamical meteorology have aged quickly. There are now signs that the theory of extratropical weather systems is beginning to settle down into a coherent whole, allowing textbooks of sufficient authority and depth to emerge and provide a solid basis for the recent past. On these grounds Professor Holton's book may be expected to enjoy a long life; it is both thorough and comprehensive; the first edition (1972) has already gained wide recognition as one of the leading texts in the field of meteorological dynamics, and this second edition will further its success, being considerably extended and revised.

The book is written at a level appropriate to final-year science undergraduates. The opening five chapters deal with the fundamental fluid dynamics applicable to atmospheric motion, in them the reader is introduced to the momentum,

thermodynamic and continuity equations, to rotating frames of reference, to vorticity and divergence, to the geostrophic and other approximations consequent upon the observed sizes of synoptic scale motion, and to the behaviour of the planetary boundary layer. These chapters together with the sixth, in which all the ideas are brought together to give a dynamical description of the mid-latitude cyclones that dominate our weather, contains as much material as many students of the subject, even at postgraduate level, will require.

To these students, especially if they are shy of mathematical notation, the word "Introduction" in the title may seem inappropriate. However, the mathematics are not difficult, and the word is appropriate as intending specialists will obtain from the remaining six chapters a mastery, straightforward entrance into the modern dynamical literature. Synoptic and dynamical scales of motion dominate the discussion, with quasi-geostrophic theory providing the unifying theme. Numerical prediction, cyclones, planetary waves and the general circulation are covered in considerable depth, including quite recent advances; reference is made in the present edition to about 20 papers written since the first edition appeared.

Smaller-scale phenomena—gravity waves, sea-breeze fronts, mesoscale convection patterns and cumulus or cumulonimbus dynamics—inevitably receive less attention, but are not totally ignored; it is simply that they are discussed mainly in terms of their influence on the larger-scale flow. It would be unfair to dwell on these omissions, which in many cases merely reflect our comparatively poor understanding of the processes, without at the same time emphasizing the wealth of material which is included. The final two chapters, on stratospheric dynamics and on

tropical motion systems, merit special mention as examples of the excellence of the book. These subjects have in the past been somewhat neglected by theoreticians preoccupied with the troposphere of temperate latitudes. Both are, however, now proving to warrant study not just for their intrinsic interest but also for the effects which they have on that region.

The new chapter on stratospheric dynamics is thus a timely and major addition to the work, which alone will lead many libraries already holding the first edition to purchase the second. It contains clear authoritative accounts of the latest ideas on sudden warmings, stratospheric waves and the mysterious quasi-biennial oscillation, subjects to which Professor Holton has made fundamental contributions. Many of the other changes for the second edition are not trivial and several increase the clarity of the discussion. I particularly liked the way the thermodynamic equation is now introduced by way of the full energy equation, the simplification in the discussion of frontogenesis and the additional problems after each chapter.

Several of the subject areas of the latter part of this book are still undergoing rapid development, and under the impact on the one hand of massive international observing programs like the Global Atmospheric Research Program, and on the other hand theoretical advances such as Lagrangian techniques, I suspect, however, that far from rendering these parts of the text rapidly obsolete, the burgeoning interest will make them essential reading for several years to come to an increasing number of atmospheric scientists.

R. S. Harwood

R. S. Harwood is lecturer in meteorology at the University of Edinburgh.

Earth's rotational parameters

The Earth's Variable Rotation: Geophysical Causes and Consequences by Kurt Lambeck. Cambridge University Press, £35.00. ISBN 0 521 22769 0.

It always seems incredible just how much information on the geophysical properties of the Earth can be obtained by simply measuring its rate of rotation. This is not to say that the measurement itself is simple, but the direct consequences of such observations are critical to our understanding of the Earth in its various processes in terms of its atmosphere, oceans and internal structure. The basic text for anyone concerned in the use of the Earth's rotational parameters has been Munk and MacDonald's *The Rotation of the Earth*, which was published in the Cambridge Monograph Series (Mechanics and Applied Mathematics) in 1960.

Until now no one has really attempted to rival this excellent book, although a few contemporary reports and short reviews have appeared in the past decade. This new book by Lambeck is published in the same series and can be regarded as the successor to Munk and MacDonald's. In addition, it supplements most published proceedings, particularly by its thorough and more uniform treatment.

There were two main reasons why this mathematical but generally readable book was required. Firstly, the measurement of both the Earth's rotation and the Earth's magnetic field, leading to a greater precision in the determination of time, has been a long-standing problem. The second, several of the basic parameters on which Munk and MacDonald based their interpretation have changed drastically. In particular, the acceptance of the concept of rotational drag on the solid plates at the Earth's surface, and the plasticity of the mantle, have led to a re-evaluation of the Earth's rotation. This is a book that is a must for anyone concerned with the modern concepts

are necessarily correct nor that Munk and MacDonald's reasoning was not sound—but it does mean that the implications of the newer observations must be considered within a radically different framework.

Lambeck does not make the error of omitting these parts of the theory of elastic and anelastic deformation that have been adequately dealt with by Munk and MacDonald, but he does attempt to provide the same basic background in a slightly different way. The structure of the book also remains similar to that of Munk and MacDonald's, with the physical theory, leading to a discussion of the means of making the requisite observations. The book then turns to look at tides, and on a gradually increasing timescale, seasonal, and then annual changes in rotation.

The Chandler Wobble inevitably follows with a discussion of the means by which it is excited. The conclusions are, rightly, uncertain, with most evidence favouring a seismic excitation mechanism but necessarily incorporating seismic and meteorological factors.

There is a chapter on "decadal fluctuations"—mostly based on observations since 1955 and hence playing little part in Munk and MacDonald's book. Again no firm conclusions are reached, but the book presents a very readable and stimulating account of the problem.

I found the last two chapters on tidal dissipation and paleogeography to be of particular interest as they are direct geological consequences. The source for the dissipation of the lunar tidal drag on the Earth has been one of interest for nearly two centuries, yet we still seem to be as far from a solution as before. Most of those studying the dissipation seem to want the dissipation to occur in the "solid" Earth, yet this would mean that tidal deceleration would be fairly constant with time, and would lead to the moon being at the same distance in 1,500 million years as it is now. There is no sign of this so-called Gerstaecker event.

In the geological record on the Earth or on the moon.

On the Earth, in fact, there is clear evidence for tidal forces operating well before this event, although it is difficult to evaluate the real magnitude of such ideas from restricted geological records. The problem can be avoided if the dissipation takes place primarily in the oceans and this would be consistent with the observations of the energy dissipated by ships at anchor near Alaska in the nineteenth century records that still form the foundation for the belief that the Bering Straits are the main locus of tidal dissipation on the present Earth. Whether this specific locus is realistic or not is conjectural but it seems necessary that the total dissipation must be primarily associated with a medium that is ephemeral on a geological timescale—and the oceans would certainly operate in this way.

Unfortunately, the few studies that have been made suggest that the paleogeographical configuration of the continents some 300 million years ago would tend to increase the deceleration of the Earth rather than decrease it, the age of the Gerstaecker event, Lambeck presents a very readable and thoughtful assessment of the present situation—again coming to no firm conclusions but providing the basic background and stimulating an interest.

A new *age* of geophysics of rotational nature, this book will clearly be necessary for any geophysical library. The cost is probably prohibitive for undergraduate use, and it may, unfortunately, be regarded as too peripheral for the level. In fact, it contains many stimulating thoughts and it presents the basic principles and concepts in a comprehensible way. The production is good, with only one figure that was for some reason left out of the excellent bibliography and two good indexes.

D. H. Tarling

D. H. Tarling is reader in the department of geophysics and planetary physics at the University of Newcastle upon Tyne.

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NOTICE BOARD

Noticeboard is compiled by Patricia Santinelli and Milla Goldie

Dr J. L. Hall, reader in plant physiology in the University of Sussex, has been appointed to a chair of biology in the University of Southampton from April, 1981.

Dr J. E. Bignell, reader in electronics at City University, has been appointed to a chair in electronics in the University of Southampton.
Mr J. M. Lee, reader at Birkbeck College, has been appointed to the chair in politics at the University of Bristol in succession to Professor Bromhead, who has retired. He held appointments in the Treasury and Civil Service Department and was senior lecturer in the Institute of Commonwealth Studies, University of London.

Dr William Lammont, reader in history at the University of Sussex, has been promoted to a professorship at the same university.
Sir Campbell Fraser, chairman of Dunlop Holdings and Scottish Television, has been appointed a visiting professor in the Strathclyde Business School. Sir Campbell has been chairman of the Business School steering board since 1976.

Dr Robert K. Shaw, course supervisor of Technology and Business Studies in Strathclyde University, has been appointed to a personal professorship. Dr M. Beestock from the London Business School has been promoted to the James Fairbairn chair of finance and investment.
Dr Kenneth Medhurst, currently reader in Government at Manchester University, has been appointed to the new chair in politics at the University of Stirling.

Forthcoming events

"Where Newcastle came from — the origins of Newcastle architecture", a special lecture in cooperation with the Northern Architectural History Society to mark the Newcastle-upon-Tyne 800th Anniversary celebrations, is to be delivered by Mr Bruce Ailsop, president of the society and formerly president of the history of architecture at the university, on November 27 at 5.30 pm in the Curtis Auditorium of the School of Physics. Admission free.

"Trade Union Responses to New Technology: An Australian Perspective" is the title of a paper to be given by Mr Gill Mansfield, general secretary of the Australian Technicians' Employees Association, at the University of Durham on December 2 at 4.35 pm in the adult education centre, 32 New Elvet. Further details from Dave Bright, convenor, Durham University Industrial Relations Group, DACE, New Elvet, Durham.

"Higher Education and the Local Community", a public lecture by Mr Pierre Duguet, secretary OECD/CERI Commission on Higher Education and the Community, is to be delivered at the Polytechnic of North London on December 2 at 4.30 pm.

Correction

Mr D. B. Guest has been appointed senior lecturer in industrial relations at the LSE and not as otherwise stated in *The Times*, November 7.

Grants

Sheffield
Applied and Computational Mathematics — Dr R. J. Moffat — £15,300 from the SRC to study the composition and dynamics of the high-velocity magnetosphere and other plasma phenomena.
Biochemistry — Professor P. M. Harrison — £25,270 from the SRC for structural studies on feritin. Dr J. E. Fitzton — £27,244 from the SRC for stephynology, synthesis, 'tuning', structure-function studies. Professor P. Banks — £28,624 from the National Fund for Research into Crippling Diseases for a study of cellular development after pedunculotomy.
Botany — Dr D. H. Lewis — £27,343 from the SRC to study the mechanism of action of fungicides potentially available at present at industrial factories.
Ceramics, Glasses and Polymers — Professor K. Rayson — £22,000 from the SRC to study the spectroscopy of glasses.
Chemical Engineering and Fuel Technology — Dr D. J. Brown — £11,897 from the NCS to study fire retardation of wood materials.
Chemistry — Dr S. Haslam — £13,600 from the SRC for a project on chromophores in the synthesis of enzyme models.
Control Engineering — Professor J. H. Nicholson — £26,500 from the SRC for recurrent support of the interactive multi-computer system.
Electronic and Electrical Engineering — Professor P. A. Benson — £4,311 from the Ministry of Defence for BS 9000 specification for custom-built integrated circuits.
Geology — Dr R. Neves and Professor C. Dowd — £63,000 from the Continental Oil Co Ltd for palynological research.
Japanese Studies — Dr G. Daniels — £10,841 from the Japan Foundation for postgraduate studentship, £600 from the Japan Foundation towards publication of the 1980 SALS conference Proceedings.

Open University programmes November 22 to 28

Saturday November 22

11.00-12.00 *Open Forum* — 48: Tomorrow's OU
12.00-1.00 *Open Forum* — 49: Tomorrow's OU
1.00-2.00 *Open Forum* — 50: Tomorrow's OU
2.00-3.00 *Open Forum* — 51: Tomorrow's OU
3.00-4.00 *Open Forum* — 52: Tomorrow's OU
4.00-5.00 *Open Forum* — 53: Tomorrow's OU
5.00-6.00 *Open Forum* — 54: Tomorrow's OU
6.00-7.00 *Open Forum* — 55: Tomorrow's OU
7.00-8.00 *Open Forum* — 56: Tomorrow's OU
8.00-9.00 *Open Forum* — 57: Tomorrow's OU
9.00-10.00 *Open Forum* — 58: Tomorrow's OU
10.00-11.00 *Open Forum* — 59: Tomorrow's OU
11.00-12.00 *Open Forum* — 60: Tomorrow's OU

Sunday November 23

10.30-11.30 *Open Forum* — 61: Tomorrow's OU
11.30-12.30 *Open Forum* — 62: Tomorrow's OU
12.30-1.30 *Open Forum* — 63: Tomorrow's OU
1.30-2.30 *Open Forum* — 64: Tomorrow's OU
2.30-3.30 *Open Forum* — 65: Tomorrow's OU
3.30-4.30 *Open Forum* — 66: Tomorrow's OU
4.30-5.30 *Open Forum* — 67: Tomorrow's OU
5.30-6.30 *Open Forum* — 68: Tomorrow's OU
6.30-7.30 *Open Forum* — 69: Tomorrow's OU
7.30-8.30 *Open Forum* — 70: Tomorrow's OU
8.30-9.30 *Open Forum* — 71: Tomorrow's OU
9.30-10.30 *Open Forum* — 72: Tomorrow's OU
10.30-11.30 *Open Forum* — 73: Tomorrow's OU
11.30-12.30 *Open Forum* — 74: Tomorrow's OU

Thursday November 27

10.30-11.30 *Open Forum* — 75: Tomorrow's OU
11.30-12.30 *Open Forum* — 76: Tomorrow's OU
12.30-1.30 *Open Forum* — 77: Tomorrow's OU
1.30-2.30 *Open Forum* — 78: Tomorrow's OU
2.30-3.30 *Open Forum* — 79: Tomorrow's OU
3.30-4.30 *Open Forum* — 80: Tomorrow's OU
4.30-5.30 *Open Forum* — 81: Tomorrow's OU
5.30-6.30 *Open Forum* — 82: Tomorrow's OU
6.30-7.30 *Open Forum* — 83: Tomorrow's OU
7.30-8.30 *Open Forum* — 84: Tomorrow's OU
8.30-9.30 *Open Forum* — 85: Tomorrow's OU
9.30-10.30 *Open Forum* — 86: Tomorrow's OU
10.30-11.30 *Open Forum* — 87: Tomorrow's OU
11.30-12.30 *Open Forum* — 88: Tomorrow's OU



"Dinah Morris preaching on Hayslope Green", a watercolour by E. H. Corbould of a scene from Adam Bede commissioned by Queen Victoria can be seen at a British Library exhibition marking the centenary of the death of George Eliot from December 11 to April 26. (Reproduced by permission of Windsor Royal Library)

Honorary degrees

Lancaster
The following are to be awarded honorary degrees on December 2:
DLitt: Sir Roger Fulford, the eminent historian and former president of the Liberal Party.
LLB: Mr William Ophar, a former of the City of London and vice-chancellor of the university's Essex campus, who served as pro-vice-chancellor between 1978 and 1980.
MA: Mrs Pat Seed, a freelance journalist whose appeal fund has raised some £2,300,000 to help cancer sufferers such as herself.

Queen Mary College, London
The following have been awarded honorary fellowships:
Mr Peter Shore, MP and former secretary of state for the environment.
Mr F. L. Monro, member of the governing body of the college, and Mr A. H. Packe, deputy chairman of the governors since 1974.

Metallurgy — Dr J. A. Whitham — £23,300 from the SRC for a study of the effect of type and distribution of inclusions upon structural properties in submicron scale and high yield strength steels.
Natural and Technological Materials — Dr D. H. Whitham — £23,300 from the SRC for a study of electron microscopy of natural and technological materials.
Microbiology — Professor J. B. Whitby — £19,463 from the SRC to study conformational serine and glycine properties in autotrophic bacteria.
Obstetrics and Gynaecology — Professor L. D. Cooke — £4,100 from WHO for core support for infertility studies.
Physics — Professor R. D. G. Isaacs — £33,889 from the SRC for development of microstructure and effects of mechanical properties and recrystallization behaviour.
Microbiology — Professor J. B. Whitby — £19,463 from the SRC to study conformational serine and glycine properties in autotrophic bacteria.
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To place your advertisements write to:
The Advertisement Manager, The Times Higher Education Supplement, P.O. Box 7, New Printing House Square, Gray's Inn Road, London WC1X 8EZ.
Tel. 01-837 1234.

Index

Fellowships and Studentships
Appointments vacant
Universities

Universities

UNIVERSITY OF ZIMBABWE

Applications are invited for the following posts which are available immediately unless otherwise indicated:

ACADEMIC POSTS

Senior Lecturer in the Department of Biology, Lecturer in Senior Lectureship in Political Science (Comparative Politics)
Lectureship/Senior Lectureship in English (African Caribbean and other Commonwealth Literatures to 1919)
Lectureship/Senior Lectureship in Quantitative Methods for Business/Operations Research/Production Management (available 1.1.81)
Lectureship/Senior Lectureship in Anatomy Morphology and/or (New-Joiners) (available 1.1.81)
Lecturer in Medicine and Allied Professions
Applicants should be registered medical practitioners holding a Higher Medical qualification. Must have clinical or academic medical experience. A senior level together with some experience of administration, supervising and promoting the development of postgraduate education. Experience of, or an interest in, university or regional arrangements for health services will be an advantage. Salary scale: Senior Lecturer (Medical) (available 1.1.81)

Master of Student Health Services/Lectureship/Senior Lectureship in Community Medicine (joint post)
The University is seeking to appoint an experienced medical practitioner to a senior level together with some experience of administration, supervising and promoting the development of postgraduate education. Experience of, or an interest in, university or regional arrangements for health services will be an advantage. Salary scale: Senior Lecturer (Medical) (available 1.1.81)

INSTITUTE OF MINING RESEARCH POSTS

Chief Chemist

Applied Geophysics

RESEARCH FELLOWSHIP

Research Fellowships, Institute of Mining Research (Mining Engineering)
Faculty of Education Research Fellowships
Applications are invited for a Research Fellowship in one of the following fields: Learning and teaching in the University's Preliminary (pre-graduate) studies; Teacher training resources; Development of a new multi-media package to reinforce formal non-formal or self-learning training.

SALARY SCALES (approx. etc. equiv.)

Professor £21,511 x 533-15,277
Senior Lecturer £2,247 x 348-10,281 x 350-12,071
Lecturer Grade I £2,015 x 332-275 x 348-8,018
Lecturer Grade II £1,452 x 348-12,844
Lecturer Grade III £1,008 x 348-11,108
Research Fellow £2,429 x 348-8,000
Research Fellow Grade I £2,220 x 340-7,088
Research Fellow Grade II £2,418 x 340-5,610
Junior Research Fellow £2,501 x 220-1,188
Sabbatical Lecturer £2,418 x 348-10,281 x 350-12,071
Visiting Lecturer £2,418 x 348-10,281 x 350-12,071
Appointments on above scales according to qualifications and experience.

CONDITIONS OF SERVICE: Both permanent pensionable terms and short-term contracts are offered for academic posts.

PARTICULARS on the above posts, on conditions of service and details of applications, may be obtained by submitting an application form to the Advertisement Officer (Staff), University of Zimbabwe, P.O. Box 167, Mount Pleasant, Salisbury, Zimbabwe. Overseas applicants should send their curriculum vitae to the Advertisement Officer, University of Zimbabwe, P.O. Box 167, Mount Pleasant, Salisbury, Zimbabwe. Applications should be submitted by 15 December 1980.

UNIVERSITY OF SURREY

HEAD OF DEPARTMENT OF CHEMICAL ENGINEERING

Applications are invited for the post of Professor of Chemical Engineering and Head of Department. The vacancy arises by virtue of the impending retirement of the present holder of the post, Professor R. R. Talley. The department has a flourishing undergraduate course and a number of well developed lines of research principally in the fields of mass transfer processes and heat transfer. In turn, the department is strongly oriented towards the needs of industry for qualified engineers and for research data. An industrial visit is mandatory for undergraduates.

The successful candidate is likely to have had both industrial and academic experience as an engineer or a research fellow of research in depth in one or more major fields of Chemical Engineering, and to be committed to the policy of industrial involvement in University teaching and research. Further particulars are available from the Academic Secretary (LFG), University of Surrey, Guildford, Surrey GU2 5XH, or telephone Guildford 71281, extension 816. Applications should be sent to the above by 12th January 1981.

Polytechnics
Technical Colleges
Colleges and Institutes of Technology
Colleges with Teacher Education
Colleges of Further Education
Colleges and Institutes of Higher Education
Colleges and Departments of Art
Research Posts
Administration

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Rates:
Classified Display—£7.25 psc
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@ £65.25
Classified Linage—£1.40 per line
Minimum 3 lines—@ £4.20
Box number—£2.00
Copy deadlines:
Classified Display:
Friday in the week prior to publication
Classified Linage:
Monday 10.00 am in the week of publication

The Chinese University of Hong Kong FACULTY OF MEDICINE Senior Lectureship/ Lectureship in Psychiatry

tenable at this new medical school, an annual student intake of 100. Applicants are expected to assume duty in July 1981.
Qualification: Applicants should possess a medical qualification (recognizable with the General Medical Council), and preferably higher academic and professional qualifications. A minimum of five years' experience in undergraduate teaching and research. Recent medical graduates may also apply for Lectureship.
Conditions of Service: Annual salary: HK\$285,116-400. 4 increments SAR 135,180-182,700 by 7 increments for Lecturer and Lectureship. Exchange rate approximately 1 HK\$ = 0.10 £ sterling. Salary and the grade to which appointment is made will depend on qualifications and experience. Terms of service include superannuation (University 15%, Government 5%), housing allowance (for applicants whose salary is above the second bracket), long leave, leaving gratuity (for applicants whose salary is above the second bracket), and for those appointed on overseas terms, including repatriation on campus and air passage as well.
Application Procedure: Further information concerning Terms of Service and application forms are obtainable from the Registrar, Faculty of Medicine, Chinese University of Hong Kong, Shatin, New Territories, Hong Kong. Completed application forms together with one set of major publications (if any) and a recent photograph should be sent to the Registrar, Faculty of Medicine, Chinese University of Hong Kong, Shatin, New Territories, Hong Kong, before August 1981. Mark 'Application on cover'.

2. SENIOR LECTURER/ LECTURER IN PHYSICS

In Electronics and General Physics, tenable as soon as possible. Applicants should have postgraduate experience and qualifications in Electronics and General Physics. Applicants will be expected to teach undergraduate courses in electronics and related topics, and to direct research in teaching laboratory work. The Department has a well equipped electronics workshop and has research activity in upper atmospheric physics, agricultural meteorology, thunderstorms and geomagnetism. An interest in aid experience of one of these areas, while not essential, will be considered an advantage.

Salaries: Senior Lecturer £17,125 p.a., Lecturer II £15,275 p.a., Lecturer £13,425 p.a. All plus gratuity (£1 sterling/£1.56).
Three-year contract; superannuation; housing allowance; leave leave leave; 18 months' leave; salary continuation scheme for extended illness or disability.

Detailed applications (two copies) including a curriculum vitae, a recent small photograph and naming three referees, should be sent to the Assistant Secretary to the Faculty of Science, Chinese University of Hong Kong, Shatin, New Territories, Hong Kong, before 15 February 1981. Applicants resident in the UK should send one copy to the University Council, 39/41 Tottenham Court Road, London W1P 0DT. Further details are available from either address.

UNIVERSITY OF PAPUA NEW GUINEA GOROKA TEACHERS' COLLEGE

Applications are invited for the post of —

SENIOR LECTURER/ LECTURER AND SENIOR TUTOR/ TUTOR IN THE LANGUAGE STUDIES DEPARTMENT

Two persons are required to teach English Courses. The posts are tenable from January, 1981. Applicants should have a degree in English or a related field and a qualification and experience in Teaching English as a Second Language. Teaching experience at Secondary or Tertiary level in a developing country is especially desirable. The Department provides English language courses for all students in the College, as well as courses for specialist students who plan to teach the English syllabus in High Schools. At least one of the appointees will be responsible for the English syllabus in the College. Salary scale: Senior Lecturer £17,125 p.a., Lecturer £15,275 p.a., Lecturer £13,425 p.a. All plus gratuity (£1 sterling/£1.56).
Three-year contract; superannuation; housing allowance; leave leave leave; 18 months' leave; salary continuation scheme for extended illness or disability. Detailed applications (two copies) including a curriculum vitae, a recent small photograph and naming three referees, should be sent to the Registrar, Faculty of Education, University of Papua New Guinea, Goroka, Papua New Guinea, before 15 December 1980. Further details are available from either address.

UNIVERSITY OF NAIROBI KENYA

Applications are invited for the post of SENIOR LECTURER IN THE DEPARTMENT OF PHYSICS. Applicants must have a Ph.D. and considerable teaching experience at both undergraduate and postgraduate levels. Research experience in Applied Geophysics, Solid State Physics, Ionospheric Physics, Theoretical Physics, Applied Electronics or Palaeomagnetism would be an added advantage. Salary scale: K22,988-3,984 p.a. (K£1 = £1.40 sterling). In very exceptional circumstances, the British Government may provide salary supplementation in the range £7,056-8,544 p.a. (sterling) (reviewed annually, normally tax-free) and associated benefits. Family passages; KESU medical scheme; subsidised housing/allowance. Detailed applications (2 copies), including a curriculum vitae and naming 3 referees, should be sent to the Registrar (Recruitment and Training), University of Nairobi, PO Box 30197, Nairobi, Kenya, to arrive no later than 15 December, 1980. Applicants resident in United Kingdom should also send a copy to the University Council, 39/41 Tottenham Court Road, London W1P 0DT. Further details are available from either address.

UNIVERSITY OF NAIROBI KENYA

Applications are invited for the post of LECTURER IN THE DEPARTMENT OF AGRICULTURAL ECONOMICS. Applicants should have a Ph.D. and must have relevant teaching and research experience in Agricultural Economics at university level. They should have a good background in Economic theory. Appointment will be expected to teach undergraduate and postgraduate courses and supervised research at undergraduate level. Salary scale: KES2,016-5,512 p.a. (K£1 = £1.10 sterling). Family passages; KESU medical scheme; subsidised housing/allowance. Detailed applications (2 copies), including a curriculum vitae and naming 3 referees, should be sent to the Registrar (Recruitment and Training), University of Nairobi, P.O. Box 30197, Nairobi, Kenya, to arrive no later than 15 December, 1980. Applicants resident in UK should also send a copy to the University Council, 39/41 Tottenham Court Road, London W1P 0DT. Further details are available from either address.

UNIVERSITY OF EAST ANGLIA Norwich

Applications are invited for a LECTURERSHIP IN ART HISTORY

In the School of Fine Arts and Music (founded in 1961). The successful candidate will be required to teach the history of art, including painting and sculpture, from 1700-1800. Professional, academic and teaching experience is essential. Salary scale: £22,016-5,512 p.a. (K£1 = £1.10 sterling). Family passages; KESU medical scheme; subsidised housing/allowance. Detailed applications (2 copies), including a curriculum vitae and naming 3 referees, should be sent to the Registrar (Recruitment and Training), University of East Anglia, Norwich, Norfolk, to arrive no later than 15 December, 1980. Applicants resident in UK should also send a copy to the University Council, 39/41 Tottenham Court Road, London W1P 0DT. Further details are available from either address.

experience. Progress in the life sciences in the United Kingdom is discussed in the various divisions of the Thurman Education Report) and further details and an outline of the form 12, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625,

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Polytechnics continued

PAISLEY COLLEGE

New Department of Politics and Sociology

PROFESSOR AND HEAD OF DEPARTMENT

Salary, £16,194

A new Department of Politics and Sociology encompassing the disciplines of Politics, Sociology and Social Philosophy has been established within the College by dividing the existing Department of Social Studies, and applications are invited for the post of Professor and Head of Department.

The Department will comprise 3 Senior Lecturers and 10 Lecturers contributing to a range of Degree, Honours Degree and Post Graduate courses.

It is expected that the successful applicant will be competent to guide the development of research and teaching within the Department and will have research and teaching experience in one or more of the following broad areas: **SOCIOLOGICAL THEORY, CONTEMPORARY INDUSTRIAL SOCIETY, MODERN POLITICS AND PUBLIC POLICY, SOCIAL PHILOSOPHY.**

Further particulars, including details of the work undertaken by the Department, and application forms may be obtained from the Personnel Officer, Paisley College of Technology, High Street, Paisley PA1 2BE (Tel.: 041-887 1241 ext. 230) to whom completed forms should be returned by Monday 8th December, 1980.

PLYMOUTH POLYTECHNIC

NATIONAL FISHERIES CENTRE DIRECTOR

With the support of the responsible local authorities a National Fisheries Centre is to be established based initially on the constituent colleges of Plymouth Polytechnic, Hull College of Higher Education, Grimsby College of Technology, and Lowestoft College of Further Education.

Applications are now being invited for the post of Director from persons having knowledge of the fishing industry, ideally with experience of teaching or research and/or of management at a senior level in industry, commerce or the professions.

The appointment initially will be for a period of two years. Salary, £15,432.

Further particulars of the post and forms of application may be obtained from Captain G. R. Hughes, Deputy Director (Resources), Plymouth Polytechnic, Drake Circus, Plymouth PL4 8AA, to whom they should be returned by December 20, 1980.

Drake Circus, Plymouth, Devon, PL4 8AA

LECTURER II/SENIOR LECTURER IN GRAPHIC DESIGN

£6,012-£11,295

A new (B.A.) degree course in Information Graphics starts in September 1981. The course, which has a number of unique characteristics, is at the stage when it offers the opportunity for a designer to specialise centrally in his development. The successful applicant will have a good grasp of design to the highest professional standards and should have the knowledge and understanding to teach the subject in a broader than usual context. Previous teaching experience in higher education will be an advantage, but not essential.

Further information and forms of application from the Assistant Director (Administration), Trent Polytechnic, Burton Road, Nottingham NG1 3BU, closing date 12 December 1980.

TRENT POLYTECHNIC NOTTINGHAM

THE POLYTECHNIC OF WALES POLITECHNIG CYMRU Temporary Lecturer Grade II/Senior Lecturer in Marketing

Salary: £6,012-£11,295 p.a.

Due to a one year secondment, the Department of Business and Administrative Studies has a vacancy from January 1981 for a Lecturer in Marketing, to teach on Degree and Diploma Courses. Applications are invited from candidates who possess a good Honours Degree and preference will be given to candidates with industrial or commercial experience in Marketing.

The closing date for applications is 15th December 1980, and interviews will be held during the week commencing 20th December. Further particulars and an application form can be obtained from:

Assistant Director (Staffing), The Polytechnic of Wales, Penarth, Mid Glamorgan CF77 1DL Telephone: Penarth 405133 Ext. 2521

The Polytechnic of Wales

WOLVERHAMPTON THE POLYTECHNIC LECTURER II/SENIOR LECTURER IN POLITICAL SCIENCE

Applications are invited from persons with a good Honours Degree in Political Science, or a related discipline, to teach on Degree and Diploma Courses. The successful applicant will have a good Honours Degree and preference will be given to candidates with industrial or commercial experience in Marketing.

Further particulars and an application form can be obtained from:

Assistant Director (Staffing), The Polytechnic of Wales, Penarth, Mid Glamorgan CF77 1DL Telephone: Penarth 405133 Ext. 2521

Colleges and Institutes of Technology

BOLTON INSTITUTE OF TECHNOLOGY MANAGEMENT AND BUSINESS STUDIES DEPARTMENT

LECTURER GRADE II

Applications are invited for the post of Lecturer Grade II to teach BSC, HND and HNC Courses in Public Administration, Organization Theory and Economics.

Candidates should be graduates in Economics or Commerce and should preferably have a higher degree in Management or Business Administration.

Salary: £6,012-£11,295 p.a. Further particulars and forms of application may be obtained from the Principal, Bolton Institute of Technology, Deane Road, Bolton BL3 5AB, to whom completed forms should be returned by December 6, 1980.

Colleges of Further Education

PROJECT DIRECTOR MICROPROCESSOR APPLICATIONS

An Engineer with up-to-date industrial experience in the design of microprocessor systems and applications is required to lead a team on the design and development of industrial project work and training courses.

Salary on the Principal Lecturer scale: £10,585-£11,712 (Bar) £13,245 p.a. plus £213 p.a. fringe allowance.

Further details and application forms from the Principal, Watford College, Watford Road, Watford, Hertfordshire, WD17 3EF, Telephone: Watford 41211.

CITY OF LONDON THE POLYTECHNIC LECTURER VII SECRETARIAL STUDIES INFORMATION TECHNOLOGY STUDIES

City of London Polytechnic invites applications from graduates for positions in the Secretarial Studies Department. The successful candidate will be responsible for the teaching of Secretarial Studies and Information Technology to students on the City of London Polytechnic Secretarial Studies Course. The successful candidate will be responsible for the teaching of Secretarial Studies and Information Technology to students on the City of London Polytechnic Secretarial Studies Course.

OXFORD THE POLYTECHNIC DEPARTMENT OF ENGINEERING SENIOR LECTURER IN ELECTRICAL ENGINEERING

Applications are invited from graduates for positions in the Department of Engineering. The successful candidate will be responsible for the teaching of Electrical Engineering to students on the Oxford Polytechnic Department of Engineering Course. The successful candidate will be responsible for the teaching of Electrical Engineering to students on the Oxford Polytechnic Department of Engineering Course.

Further particulars and forms of application may be obtained from the Principal, Oxford Polytechnic, Oxford OX2 0EL, to whom completed forms should be returned by December 15th, 1980.

For Sale and Wanted

FOR SALE

Shilton, 16 Herts. Loughborough Laboratory complete with all of apparatus and books in the field of Physics. Also a good collection of books. Price £1,000.00. Tel: 0454 611111.

Shilton, 16 Herts. Loughborough Laboratory complete with all of apparatus and books in the field of Physics. Also a good collection of books. Price £1,000.00. Tel: 0454 611111.

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Shilton, 16 Herts. Loughborough Laboratory complete with all of apparatus and books in the field of Physics. Also a good collection of books. Price £1,000.00. Tel: 0454 611111.

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Colleges of Higher Education

GWENT

COLLEGE OF HIGHER EDUCATION LECTURER II IN MANAGEMENT

Applicants should be professionally qualified graduates with managerial experience in industry, commerce or professional practice and preferably will have previous teaching experience.

The successful candidate will join an experienced team involved in teaching management on professional and post-graduate courses and in working with employers in designing and operating training programmes.

For further details and application forms apply to: Principal, Administrative Officer, Gwent College of Higher Education, College Crescent, Gwent NP23 5XX. Application forms to be returned within 14 days of the appearance of this advertisement.

CAMBRIDGESHIRE COLLEGE OF ARTS AND TECHNOLOGY

Head of Chemistry Section Principal Lecturer

The Section is responsible for full-time CNAH Honours degree teaching and for a wide range of part-time courses, including GRSC and Higher TEC, for students from local industry, research establishments and the University.

Starting date 1st May, 1981; salary £10,500 to £13,245, starting point depending on qualifications and experience.

Forms and further details from Head of Department of Science, CCAT, Cambridge CB1 2AJ. Forms to be returned by December 15th.

BEDFORDSHIRE EDUCATION SERVICE LUTON COLLEGE OF HIGHER EDUCATION LECTURER GRADE II IN PHYSICS

Applications are invited for the post of Lecturer Grade II in Physics. The successful candidate will be responsible for the teaching of Physics to students on the Bedfordshire Education Service Luton College of Higher Education Course. The successful candidate will be responsible for the teaching of Physics to students on the Bedfordshire Education Service Luton College of Higher Education Course.

Further particulars and forms of application may be obtained from the Principal, Bedfordshire Education Service, Luton College of Higher Education, Luton, Bedfordshire, LU1 3JH, to whom completed forms should be returned by December 15th, 1980.

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Administration continued

NEWCASTLE UPON TYNE THE UNIVERSITY ASSISTANT REGISTRAR

Applications are invited from graduates for positions in the Department of Registrar. The successful candidate will be responsible for the registration of students on the Newcastle University Course. The successful candidate will be responsible for the registration of students on the Newcastle University Course.

Colleges of Education

CAMBRIDGE HOMERIDGE COLLEGE PRINCIPAL LECTURER IN ENGLISH

Applications are invited for the post of Principal Lecturer in English. The successful candidate will be responsible for the teaching of English to students on the Cambridge Homeridge College Course. The successful candidate will be responsible for the teaching of English to students on the Cambridge Homeridge College Course.

Research Posts

BATH THE UNIVERSITY SCHOOL OF MATHEMATICS RESEARCH OFFER IN COMPUTING

Applications are invited for the post of Research Officer in Computing. The successful candidate will be responsible for the research in Computing on the Bath University School of Mathematics Course. The successful candidate will be responsible for the research in Computing on the Bath University School of Mathematics Course.

EDINBURGH HERIOT-WATT UNIVERSITY DEPARTMENT OF CHEMISTRY POSTGRADUATE RESEARCH ASSOCIATE

Applications are invited for the post of Postgraduate Research Associate in Chemistry. The successful candidate will be responsible for the research in Chemistry on the Heriot-Watt University Department of Chemistry Course. The successful candidate will be responsible for the research in Chemistry on the Heriot-Watt University Department of Chemistry Course.

CARDIFF UNIVERSITY COLLEGE DEPARTMENT OF PHYSIOLOGY RESEARCH ASSISTANT

Applications are invited for the post of Research Assistant in Physiology. The successful candidate will be responsible for the research in Physiology on the Cardiff University College Department of Physiology Course. The successful candidate will be responsible for the research in Physiology on the Cardiff University College Department of Physiology Course.

REMINDER

Copy for classified advertisements in the Times Higher Education Supplement should be sent to the publishers, not later than 10.30 a.m. on Monday, preceding the date of publication.

PLYMOUTH POLYTECHNIC

Faculty of Technology Department of Mathematics Statistics and Computing

RESEARCH ASSISTANT IN RHEOLOGY OR RUBBER TECHNOLOGY

Applications are invited from graduates for positions in the Department of Rheology or Rubber Technology. The successful candidate will be responsible for the research in Rheology or Rubber Technology on the Plymouth Polytechnic Faculty of Technology Course. The successful candidate will be responsible for the research in Rheology or Rubber Technology on the Plymouth Polytechnic Faculty of Technology Course.

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CARDIFF UNIVERSITY COLLEGE DEPARTMENT OF PHYSIOLOGY RESEARCH ASSISTANT

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REMINDER

Copy for classified advertisements in the Times Higher Education Supplement should be sent to the publishers, not later than 10.30 a.m. on Monday, preceding the date of publication.

Overseas

UNIVERSITY OF NATAL

DEPARTMENT OF BUSINESS ADMINISTRATION PIETERMARITZBURG

Applications are invited from suitably qualified persons regardless of sex, religion, race, colour or national origin, for appointment to the post of:

SENIOR LECTURER/LECTURER

This post arises due to expansion of the department. Candidates should have good academic qualifications with a major interest in one of the undermentioned areas, although applicants with interests in other fields of Business Administration would be considered. Practical experience in Business or Public Administration would be an advantage. The work of the Department covers the following main areas: Business Finance, Marketing, Management, Personnel, Methods in Management, the Principles and Functions of Management, and Business Policy and Corporate Planning. This newly created post has been established from 1st January, 1981, but the successful candidate should be free to take up the appointment on 1st March, 1981 or as soon as possible thereafter.

The salary will be in the range:

Senior Lecturer R12,750-R17,100

Lecturer R9,150-R14,850

The commencing salary notch will be dependent on the qualifications and/or experience of the successful applicant.

In addition, an annual vacation savings bonus of 5% of one month's salary is payable, subject to Treasury regulations. Application forms, further particulars of the post and information on pension, medical aid, group insurance, staff bursary, housing loan and subsidy schemes, long leave conditions, and travelling expenses on first appointment are obtainable from the Registrar, University of Natal, P.O. Box 375, Pietermaritzburg 3200. Telephone: 63320. Applications on the prescribed form, must be lodged not later than 16th January, 1981 quoting reference PMB/70/80.

INSTITUTE OF AGRICULTURAL RESEARCH AND TRAINING, MOOR PLANTATION, IRADAN (UNIVERSITY OF IFE)

Applications are invited from suitably qualified candidates for the following vacancies:

(a) Senior Tutor G.L. 12 N7404-N8052 p.a.

(b) Tutor Grade I G.L. 11 N6744-N7284 p.a.

(under review)

Qualifications

(a) Degree in Agricultural Engineering plus a higher degree in Agricultural Engineering or Agricultural Engineering and at least three years' teaching or research experience following the higher degree.

(b) Degree in Agricultural Engineering with a minimum of five years' teaching/research experience.

Conditions of Service

Appointment on permanent or contract basis. Contract appointments attract an addition of 25% transport allowance, part-furnished accommodation at 5% of basic salary or housing allowance. Passage for appointee, wife and up to five children.

Method of Application

Four typewritten copies of curriculum vitae stating post required, full name, date and place of birth, current postal address and telephone number, nationality, marital status, educational qualifications with dates, names of referees held with dates, names of three referees who know you professionally. Applicants should request referees to forward confidential reports to:

Principal Assistant Secretary (Recruitment), Nigerian Universities Office, 180 Tottenham Court Road, London, W1P 9LE

to whom applications should be sent by 5th December, 1980.

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Laurie Taylor



Yes, thank you nurse. I'm sure that'll be all right. Yes, do leave the blanket. Well, hello Mr. Graddick. Welcome back to the department. Yes do come in. Can I help you with your coat? There. And you stick? You want to keep that with you. Fine, fine. Now why don't you come over here. No, over here. Towards me. Yes, that's right. No need to hurry. One step at a time. Is fine. More haste, less speed, oh? Now how about this chair here. Let me help you. There. Comfortable? Good. Well, splendid to see you. No difficulty finding the old place?

Damn fool signs. What's that Mr. Graddick?

Damn fool signs all over the place. Just confuse a man. Didn't need them in my day. Found our own way.

Quill. Well I expect you'll have noticed quite a lot of changes since you were last here. Lots more students and buildings.

Damn fool machines everywhere. Yes, yes. How true. Another sign of the times I'm afraid.

Even machines for cigarettes. True enough.

How much these days? Sir—cigarettes? Oh about 70p for 20.

Just goes to show doesn't it. In my day you could get ten Woodbines from the corner shop and still walk home with change from a shilling in your pocket.

Yes, indeed. Times have certainly changed.

And damn fool cars everywhere. True enough.

When I was a student you could get the tram from outside the Ritz and ride up here to the university for two pence. No need for those damn fool contraptions. That's the trouble with young people today. More money than sense.

True, true. But don't excite yourself too much Mr. Graddick. Just take it easy. Yes, that's right. Here's your water.

They tell me Professor Myers has passed on.

Yes, yes. Most sad. Before my time, I'm afraid. Oh, must be 15 years ago. But I heard that he went as he wished. Right in the middle of a first-year lecture.

Good thing. Put me on the right lines. I was his favourite graduate, you know.

Yes, I believe he was well thought of. A great pity. A great pity. Actually, Mr. Graddick, it was in connection with this sort of area that I wanted to have a word with you.

You don't know the meaning of work these days.

No, quite. You see the problem is just what to do to make it right. What's that?

SRRC. Social Research Council. They're the people who keep an eye on things these days. Damn coopers.

Absolutely. Much my opinion. But they rather call the tune these days, and recently they've been getting just a little bit keen on keeping up to date records on the performance of individual departments who go to them for money. And that's what I was wondering.

What's that? Can't hear you, well, you know.

No urgency of course. All in good time and all that. A purely bureaucratic necessity. We're doing the same with the students, but do you think that you could possibly...

What's that? Still can't hear you properly?

MR GRADDICK DEAR OLD CHAP COULD YOU POSSIBLY GIVE US SOME IDEA OF HOW YOUR PUPILS ARE COMING ALONG.

LETTERS TO THE EDITOR

The pay of university teachers

Sir—I do not really mind getting gratuitous advice in your editorials on how AUT should handle its pay problems, but please before you tell us what to do, find out what we have done.

You say that the AUT and the University Authorities Panel should act quickly to prevent university teachers' income being engulfed in the 6 per cent incomes policy and perhaps it might be useful to say what steps have been taken.

First, both the AUT and the UAP put forward proposals during the substitute Clegg negotiations in July to try to settle the October 1 1980 pay rates at the same time. This was flatly refused and turned down by the Government.

Second, AUT thereupon submitted

its October 1 1980 claim three days after the Clegg settlement was made.

Third, we have made representations formally and informally to the DES for an early settlement.

Fourth, we made representations to the Secretary of State pointing out that the bulk of the October 1 1980 pay settlements would fall in the 1980-81 cash limit year, and perhaps be treated in that light.

Fifth, we made moves in political circles to try to resolve the issue.

Sixth... perhaps I should stop here since I could fill a whole page of the paper with details of the moves we have made and short of the AUT being able to turn off the nation's power tonight or stopping the trains tomorrow, it is difficult

to see what else could have been achieved.

I think perhaps that *THEES* should be more aware of the fact that what will happen to university teachers' pay (as with the firemen and other groups) will be as a result of direct political action and force majeure on the part of the Government. The merits of cases are not really considered. Undertakings are not honoured and cynicism prevails. The issue goes far wider than the universities or indeed higher education and the sooner everyone learns this lesson the better.

Yours sincerely,
LAURIE TAYLOR
General Secretary, Association of University Teachers, Pembroke Road, London, W.11.

South Africa 'whitewash'

Sir—If the summary of the Witwatersrand by your special correspondent (*THEES* October 23) is a "whitewash" of the conditions in South Africa,

There is a clear failure to face the realities of a country now at war. The war is being fought by the whites to maintain their total grip in political power and the economy. The war is being fought by the blacks for their freedom. In this context, it is wrong for the blacks through projects such as those described in the document to be irrelevant.

On your correspondent's admission, currently 90 per cent of the students at Wits are white. This is in a country where the white population makes up less than 10 per cent of the total population. Statistics which prove the imbalance of the apartheid system about indicating enormous disparities in terms of incomes, health, land ownership as well as education.

There is a clear danger of people in this country becoming content over the relative immobility of ameliorations such as those we correspondents describe, as well as the other cosmetic changes being implemented by the apartheid regime. I was therefore appalled at your publishing this virtual press release on apartheid, rather than a balanced review of the document in the context of the events and conditions in South African universities.

This confusion is in danger of diverting the AUT policy to beyond the apartheid education system. The decision of the May committee to reject the "tribal colleges" in South Africa was reached after many years of talk in this area, and indicates a welcome change of action rather than words. Now is the time for the strict implementation of the embargo, as tangible support for the blacks, rather than political trappings of apartheid may be altered.

Yours sincerely,
PETER WILKINS,
Green Down,
Chewton Mendip,
Avon.

The teaching of Dutch

Sir—Your correspondent Lord Cohen reported (*THEES*, September 26) that the recently signed agreement for the teaching of Dutch in the United Kingdom, and second, that little has yet been done to teach this subject.

As regards the first point, Dutch is a relatively popular subject at 12 University Colleges in the United Kingdom, and also as a language and literature in Dutch universities. The subject is taught in a number of schools, and also as a language and literature in Dutch universities.

The second point, that little has yet been done to teach this subject, is a pity. The subject is taught in a number of schools, and also as a language and literature in Dutch universities.

Yours faithfully,
VALERIE SAUNDERS,
68 Rochford,
Coffee Hall,
Millon Keynes.

NUS funds

Sir—I am writing to correct a false impression given in your article on NUS funds (*THEES*, October 4). In this article you have stated that the NUS funds have refused to fund an overdraft of £37,000.

The facts of the case are that whereas the majority of polytechnics received increases in their income of between 10 and 14 per cent, we received an increase of 10 per cent, and this caused a shortfall on our budget of approximately £37,000. The union has not accumulated any overdraft, but its general fund has always acted responsibly within the limits of the funds made available.

Yours faithfully,
M. BEKKARRY,
Treasurer, Middlesex Polytechnic Students' Union.

Rockefeller Foundation

Sir—It is a minor point, but in your editorial (*THEES*, October 24) you refer to Dr Lyman as "Rockefeller's new director." He is the new president of the Rockefeller Foundation. This distinction is important, but there is the position of "director of the humanities" within the Rockefeller Foundation, among several other directors of disciplinary divisions of the foundation.

Yours faithfully,
JAMES S. COLEMAN,
University of California,
Los Angeles



HIGHER EDUCATION SUPPLEMENT
New Printing House Square, London WC1X 8EZ, Telephone 01-837 1234

Why UGC intervention is right

For at least 20 years the University Grants Committee has been regularly accused of a strange foreign-sounding crime, *dirigisme*, which roughly translated means the imposition of the priorities of individual universities. For 20 years just as the charge against the UGC has been found not proven, so the new rules and to suggest the new practices that can sustain this rather precarious equilibrium in the 1980s and encourage it to develop into a broader and more creative consensus for the 1990s.

For this reason, although the charge of *dirigisme* against the UGC may be able finally to be proved, there is now a strong case for saying that the committee should be praised rather than condemned on that account. Of course, many in universities will disagree. One group will continue to regard rationalization as a dirty word, oblivious of the fact that the choice is not between rationalization and no rationalization (or no cuts) but between rationalization and irrationalization, and of the even more important fact that this Verdun-style attitude will lead to a spirit of closure which will disappoint progressive hopes for a more democratic extension of higher education, just as surely as the acts of the present Government.

A second group will make legalistic objections, as Professor Griffith, chairman of the Campaign for Academic Freedom and Democracy, did in a letter to *The Times* last week. They will argue, entirely correctly, that the UGC does not have the power to instruct universities and more should not allow themselves to be instructed by the UGC. Dr Parkes has already answered the substance of this objection. Rightly he has pointed out that the true autonomy of the British universities is not in their capacity to run their own affairs, individually as institutions and collectively through the UGC. The deadliest threat to that autonomy will arise if doubt is thrown on that capacity.

A third group will make practical objections. They will argue that the UGC does not have the capacity to undertake a wide ranging policy of rationalization across all universities and across all disciplines. At their most, they will argue, the UGC can only advise, and that is not enough. They will argue that the UGC is not a body which can make decisions which are binding on universities. They will argue that the UGC is not a body which can make decisions which are binding on universities.

However, the main reason for the UGC's apparent non-enthusiasm for intervention is that the total environment, political, financial, social, and cultural, in which universities exist is not entirely different from that of the environment that existed in the 1950s and 1970s. Robbins years of quantitative change are over, and so too are the years of crisis and disintegration.

It is not surprising that the UGC does not have the capacity to undertake a wide ranging policy of rationalization across all universities and across all disciplines. At their most, they will argue, the UGC can only advise, and that is not enough. They will argue that the UGC is not a body which can make decisions which are binding on universities. They will argue that the UGC is not a body which can make decisions which are binding on universities.

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For at least 20 years the University Grants Committee has been regularly accused of a strange foreign-sounding crime, *dirigisme*, which roughly translated means the imposition of the priorities of individual universities. For 20 years just as the charge against the UGC has been found not proven, so the new rules and to suggest the new practices that can sustain this rather precarious equilibrium in the 1980s and encourage it to develop into a broader and more creative consensus for the 1990s.

For this reason, although the charge of *dirigisme* against the UGC may be able finally to be proved, there is now a strong case for saying that the committee should be praised rather than condemned on that account. Of course, many in universities will disagree. One group will continue to regard rationalization as a dirty word, oblivious of the fact that the choice is not between rationalization and no rationalization (or no cuts) but between rationalization and irrationalization, and of the even more important fact that this Verdun-style attitude will lead to a spirit of closure which will disappoint progressive hopes for a more democratic extension of higher education, just as surely as the acts of the present Government.

A second group will make legalistic objections, as Professor Griffith, chairman of the Campaign for Academic Freedom and Democracy, did in a letter to *The Times* last week. They will argue, entirely correctly, that the UGC does not have the power to instruct universities and more should not allow themselves to be instructed by the UGC. Dr Parkes has already answered the substance of this objection. Rightly he has pointed out that the true autonomy of the British universities is not in their capacity to run their own affairs, individually as institutions and collectively through the UGC. The deadliest threat to that autonomy will arise if doubt is thrown on that capacity.

A third group will make practical objections. They will argue that the UGC does not have the capacity to undertake a wide ranging policy of rationalization across all universities and across all disciplines. At their most, they will argue, the UGC can only advise, and that is not enough. They will argue that the UGC is not a body which can make decisions which are binding on universities. They will argue that the UGC is not a body which can make decisions which are binding on universities.

However, the main reason for the UGC's apparent non-enthusiasm for intervention is that the total environment, political, financial, social, and cultural, in which universities exist is not entirely different from that of the environment that existed in the 1950s and 1970s. Robbins years of quantitative change are over, and so too are the years of crisis and disintegration.

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